Phillips Creek Ranch Hike and Bike Trail
Bid No. 1205-052

ADDENDUM #1

Pre-Bid Meeting Questions

1. Appears sidewalk quantity is included on Page 12 and 15 of the bid form. Is this correct? **Sidewalk quantity has been duplicated. Extra line item has been removed and new bid form issued as part of Addendum 1.**

2. Are City impact fees waived for the project? **Fees required will be typical for a City project.**

3. Earthwork is required to meet a PI between 8 and 40. Does the onsite material meet this requirement? Is a geotech report available? **Vista Park on-site soils are greater than the TXDOT Plasticity Index (PI) maximum requirement of 40. PI's generally range between 45 to 55 due to soils being within the Eagle Ford formation. TXDOT general notes require the PI be reduced to 40 or less for embankment fill under the fire lane & parking lot pavement. The general note section further indicates that lime slurry may be used to reduce the PI to acceptable levels on Sheet D.**

4. Who is responsible for testing costs? **Phillips Creek Ranch will be performing required testing.**

5. With the city requirement of the primary contactor doing 50% of the work, the TxDOT requirement of 18.2% DBE useage, and the nature of the work, it may be difficult to meet all of these goals. What possibility exists for variation? **Contractor needs to make a good faith effort to meet the DBE/HUB goals shown in the project manual as required by TxDOT.**

6. Can the contractor work on Milestone 1 and Milestone 2 at the same time? **Contractor will be allowed to work on Milestone 1 and Milestone 2 at the same time, but must meet the completion times for each separately.**

7. The number of total days seems to be inconsistent between the contract schedule, the contract time, and the Barricade/Traffic Control bid item. **Milestone 1 must be completed in 60 calendar days and the entire project completed within 180 calendar days. Project schedule and bid item for Barricades/Traffic Control have been revised in Addendum 1.**

8. Pier quantities bid by EA. Are these anticipated to be to the depth shown on the plans? **Yes. Pier detail 9/S1.1 was stamped by a licensed Structural Engineer and influenced by the soils report recommendations.**

9. Is Lime Stabilization required under the sidewalks? **Lime Stabilization is not included under the sidewalks.**

10. **Note existing paving at Lone Star Ranch Parkway, directly south of the intersection with Stonebrook Parkway will require a 14" bore for irrigation mainline.**

11. **An existing 24" casing has already been provided under Canyon Ranch Road for the irrigation mainline. Ref. 2/LI 3.2**

Project Manual Revisions

1. Replace Project Schedule (page 4 of 228) with new provided
2. Replace Bid Form (sheets 19-24 of 228) with new provided
3. Special Condition 6 deleted (sheet 42 of 228)
4. Replace General Notes Sheet A (sheet 44 of 228) with new provided
5. Replace Special Provision Index (sheet 52 of 228) with new provided
6. Added Special Provision 007-918
7. Added Non-collusion Statement

Additional Questions Received

1. On sheet C.4 there is a mountable curb with 3' brick paver band around the west median on Phillips Creek Rd. There is a detail on sheet C.6 with a 6" concrete base. Is this quantity intended to be paved as concrete paving or is there another bid item for it?
   The paver band adjacent to the roll over curb occurs in the median area of the turn-around only. This was added as requested by the Frisco Fire Department. There is a separate bid item for the modified mountable curb which includes the paver band. The 6-inch concrete under the pavers and the pavers are subsidiary to the mountable curb bid item.

PHILLIPS CREEK RANCH - STEP GRANT PROPOSAL SHEET

VISTA PARK IMPROVEMENTS (MILESTONE #1)

Item No.	Description Code	Special Provision	Description (with Unit Price in words)	Bid Total	Unit Bid Price	Unit	Amount Bid
100	2001	100-002	ROW *Complete and in place for the sum of:* *Dollars and Cents per unit*	7		AC	$ -
110	2001		Excavation (Roadway) *Complete and in place for the sum of:* *Dollars and Cents per unit*	1720		CY	$ -
110	2003		Excavation (Channel) *Complete and in place for the sum of:* *Dollars and Cents per unit*	23000		CY	$ -
132	2006		Embankment (Final) (Dens Cont) (Type C) *Complete and in place for the sum of:* *Dollars and Cents per unit*	16940		CY	$ -
~~132~~	~~2022~~		~~Embankment (Vehicle) (Dens Cont) (Type C)~~ ~~*Complete and in place for the sum of:*~~ ~~*Dollars and Cents per unit*~~	~~7780~~		~~CY~~	~~$~~
260	2006	260-003	Lime Treatment (Exst Matl) (6") *Complete and in place for the sum of:* *Dollars and Cents per unit*	1240		SY	$ -
260	2027	260-003	Lime Treatment (Exst Matl) (8") *Complete and in place for the sum of:* *Dollars and Cents per unit*	3980		SY	$ -
260	2002	260-003	Lime (Hydrated Lime) (Slurry) *Complete and in place for the sum of:* *Dollars and Cents per unit*	155		TON	$ -
360	2023	360-003	Concrete Pavement (JRCP) (6") *Complete and in place for the sum of:* *Dollars and Cents per unit*	3255		SY	$ -
360	2023	360-003	Concrete Pavement (JRCP) (5") *Complete and in place for the sum of:* *Dollars and Cents per unit*	937		SY	$ -
400	2004		Cem Stabil Bkfl *Complete and in place for the sum of:* *Dollars and Cents per unit*	10		CY	$ -
402	2001		Trench Excavation Protection *Complete and in place for the sum of:* *Dollars and Cents per unit*	1030		LF ~~CY~~	$ -
432	2077		Rip Rap (Stone Common) (Grouted) (18") *Complete and in place for the sum of:* *Dollars and Cents per unit*	31		CY	$ -
464	2003	464-006	RCP (Class III) (18") *Complete and in place for the sum of:* *Dollars and Cents per unit*	20		LF	$ -

464	2004	464-006	RCP (Class III) (21") *Complete and in place for the sum of:* *Dollars and Cents per unit*	211		LF	$ -
465	2305	465-001	Inlet (Comp) (Grate) (Spl) *Complete and in place for the sum of:* *Dollars and Cents per unit*	2		EA	$ -
465	2001	465-001	Inlet (Compl) (Ty C) *Complete and in place for the sum of:* *Dollars and Cents per unit*	1		EA	$ -
466	2305		Headwall (Special) *Complete and in place for the sum of:* *Dollars and Cents per unit*	2		EA	$ -
500	2001	500-005	Mobilization *Complete and in place for the sum of:* *Dollars and Cents per unit*	1		LS	$ -
502	2001	502-033	Barricades, Signs, and Traffic Handling *Complete and in place for the sum of:* *Dollars and Cents per unit*	6 ~~10~~		MO ~~EA~~	$ -
506	2034	506-010	Temporary Sediment Control Fence *Complete and in place for the sum of:* *Dollars and Cents per unit*	26903		LF	$ -
506	2016	506-010	Construction Exit (Install) (Ty 1) *Complete and in place for the sum of:* *Dollars and Cents per unit*	420		SY	$ -
506	2019	506-010	Construction Exit (Remove) *Complete and in place for the sum of:* *Dollars and Cents per unit*	420		SY	$ -
506	2041	506-010	Temp Sdmt Cont Fence (Inlet Protect) *Complete and in place for the sum of:* *Dollars and Cents per unit*	2		EA	$ -
529	2006		Concrete Curb (Mono) (Ty II) *Complete and in place for the sum of:* *Dollars and Cents per unit*	1194		LF	$ -
529	2006		Concrete Curb (Mountable) *Complete and in place for the sum of:* *Dollars and Cents per unit*	135		LF	$ -
644	2001		Small Roadside Sign Supports and Assemblies *Complete and in place for the sum of:* *Dollars and Cents per unit*	4 ~~6~~		EA	$ -
666	2012		Refl Pvmt Mrk Ty I (W) (4") (SLD) (100 mil) *Complete and in place for the sum of:* *Dollars and Cents per unit*	1114		LF	$ -
666	2288		Ref Pvmt Mrk Ty II (Red) (No Park Lane) *Complete and in place for the sum of:* *Dollars and Cents per unit*	1604		LF	$ -
668	2002		Prefab Pav Mrk (Acc Prk)(Blu & Wht) Lrg *Complete and in place for the sum of:*				

			Dollars and Cents per unit	2		EA ~~LF~~	$ -
678	2001		Pav Surf Prep for Mrk (4") *Complete and in place for the sum of:* *Dollars and Cents per unit*	2718		LF	$ -
678	2049		Pav Surf Prep For Mrk (Accessible Parking Symbol) *Complete and in place for the sum of:* *Dollars and Cents per unit*	2		EA ~~LF~~	$ -
5434	2001		Wheel Stops *Complete and in place for the sum of:* *Dollars and Cents per unit*	20		EA	$ -
071300			10 Mil Poly 6' width behind Concrete Pavement *Complete and in place for the sum of:* *Dollars and Cents per unit*	1015		SY	$ -
321112			Moisture Conditioning *Complete and in place for the sum of:* *Dollars and Cents per unit*	6310		CY ~~SY~~	$ -

TRAIL IMPROVEMENTS (MILESTONE #2)

Item No.	Description Code	Special Provision	Description	Bid Total	Unit Price	Unit	Amount
162	2002		Block Sodding *Complete and in place for the sum of:* *Dollars and Cents per unit*	8990		SY	$ -
164	2023	164-002	Cell Fbr Mlch Seed (Perm) (Rural) (Clay) *Complete and in place for the sum of:* *Dollars and Cents per unit*	136050		SY	$ -
170	2001		Irrigation System *Complete and in place for the sum of:* *Dollars and Cents per unit*	1		LS	$ -
192	2027		Plant Material (100 Gal) *Complete and in place for the sum of:* *Dollars and Cents per unit*	735		EA	$ -
192	2026		Plant Material (65 Gal) (Tree) *Complete and in place for the sum of:* *Dollars and Cents per unit*	132		EA	$ -
192	2080		Plant Material (Min. 6" caliper)(Tree) *Complete and in place for the sum of:* *Dollars and Cents per unit*	7		EA	$ -
423	2025		Retaining Wall (Special) *Complete and in place for the sum of:* *Dollars and Cents per unit*	8775		SF	$ -
531	2024		Conc Sidewalk (5") *Complete and in place for the sum of:* *Dollars and Cents per unit*	27990		SY	$ -
531	2010		Curb Ramps (Type 7) *Complete and in place for the sum of:* *Dollars and Cents per unit*	8		EA	$ -

531	2040		Curb Ramps (Type 5) *Complete and in place for the sum of:* *Dollars and Cents per unit*	1		EA	$ -
531	2010		Curb Ramps (Type 7) *Complete and in place for the sum of:* *Dollars and Cents per unit*	28		EA	$ -
26 05 34	2044		3/4" Rigid Conduit *Complete and in place for the sum of:* *Dollars and Cents per unit*	10		LF	$ -
26 05 34	2046		1" Rigid Conduit *Complete and in place for the sum of:* *Dollars and Cents per unit*	10		LF	$ -
26 05 34	2012		1" PVC Conduit *Complete and in place for the sum of:* *Dollars and Cents per unit*	2376		LF	$ -
26 05 34	2016		1 1/2" PVC Conduit *Complete and in place for the sum of:* *Dollars and Cents per unit*	3076		LF	$ -
26 05 34	2018		2" PVC Conduit *Complete and in place for the sum of:* *Dollars and Cents per unit*	13136		LF	$ -
26 05 34			3 1/2" PVC Conduit *Complete and in place for the sum of:* *Dollars and Cents per unit*	360		LF	$ -
26 05 00	2004		#2 AWG THHN Copper Conductor *Complete and in place for the sum of:* *Dollars and Cents per unit*	14508		LF	$ -
26 05 00			#1/0 AWG THHN Copper Conductor *Complete and in place for the sum of:* *Dollars and Cents per unit*	11100		LF	$ -
26 05 00			#3/0 AWG THHN Copper Conductor *Complete and in place for the sum of:* *Dollars and Cents per unit*	14940		LF	$ -
26 05 00	2014		#10 AWG THHN Copper Conductor *Complete and in place for the sum of:* *Dollars and Cents per unit*	3470		LF	$ -
26 05 00	2012		#8 AWG THHN Copper Conductor *Complete and in place for the sum of:* *Dollars and Cents per unit*	6268		LF	$ -
26 05 00	2010		#6 AWG THHN Copper Conductor *Complete and in place for the sum of:* *Dollars and Cents per unit*	3588		LF	$ -

26 05 00	2008		#4 AWG THHN Copper Conductor *Complete and in place for the sum of:* *Dollars and Cents per unit*	3900		LF	$ -
26 24 16			Panelboard HA: 480Y/277, 225A, 24 Circuits *Complete and in place for the sum of:* *Dollars and Cents per unit*	1		EA	$ -
26 24 16			Panelboard LA: 208Y/120, 50A, 24 Circuits *Complete and in place for the sum of:* *Dollars and Cents per unit*	1		EA	$ -
26 24 16			Lighting Relay Control System *Complete and in place for the sum of:* *Dollars and Cents per unit*	1		EA	$ -
26 22 00			TRLA Transformer: 15 KVA, 480 Primary, 208 Secondary, Dry *Complete and in place for the sum of:* *Dollars and Cents per unit*	1		EA	$ -
26 05 29			Unistrut For Panelboard *Complete and in place for the sum of:* *Dollars and Cents per unit*	16		EA	$ -
03 36 00			Colored Textured Conc (5") *Complete and in place for the sum of:* *Dollars and Cents per unit*	420		SY	$ -
05 52 00			M.3 - Steel guardrail at boardwalk *Complete and in place for the sum of:* *Dollars and Cents per unit*	425		LF	$ -
265620			L.1 - Trapezoidal illuminated bollard *Complete and in place for the sum of:* *Dollars and Cents per unit*	17		EA	$ -
265620			L.2 - Sconce lighting - mounted on guardrail *Complete and in place for the sum of:* *Dollars and Cents per unit*	41		EA	$ -
265619			L.3 - Pole top lights *Complete and in place for the sum of:* *Dollars and Cents per unit*	11		EA	$ -
265619			L.4 - Pole top lights - double *Complete and in place for the sum of:* *Dollars and Cents per unit*	4		EA	$ -

265620			L.5 - Tree uplight - in grade mount (2 at each Transplant Tree) *Complete and in place for the sum of:* *Dollars and Cents per unit*	6		EA	$ -
12 93 00			Backless bench - Landscape Forms - Arcata *Complete and in place for the sum of:* *Dollars and Cents per unit*	12		EA	$ -
033101			Drilled Shaft Foundation *Complete and in place for the sum of:* *Dollars and Cents per unit*	82		EA	$ -
~~321650~~			~~Conc Sidewalk (5")~~ ~~*Complete and in place for the sum of:*~~ ~~*Dollars and Cents per unit*~~	~~27990~~		~~SY~~	~~$ -~~
321650			Concrete slab at Vista Park Lake Bottom *Complete and in place for the sum of:* *Dollars and Cents per unit*	13050		SF	$ -
329600			T - Transplant Live Oak *Complete and in place for the sum of:* *Dollars and Cents per unit*	3		EA	$ -
33 00 15			S.5 - Mexican Beach Pebble *Complete and in place for the sum of:* *Dollars and Cents per unit*	1		TON	$ -

PROJECT TOTAL **$ -**

(Project Total in Words)

Exceptions and Notes: _____

Contractor (Firm Name) _____

By: _____

Title: _____

FORM 2
NON-COLLUSION AFFIDAVIT*

STATE OF_____)
)ss:
COUNTY OF_____)

Each of the undersigned, being first duly sworn, deposes and says that:

A. _____ is the _____ of _____ and _____ is the _____ of _____, which entity(ies) are the _____ of _____, the entity making the foregoing Proposal.

B. The Proposal is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, joint venture, limited liability company or corporation; the Proposal is genuine and not collusive or sham; the Proposer has not directly or indirectly induced or solicited any other Proposer to put in a false or sham Proposal, and has not directly or indirectly colluded, conspired, connived or agreed with any Proposer or anyone else to put in a sham Proposal or that anyone shall refrain from proposing; the Proposer has not in any manner, directly or indirectly, sought by agreement, communication or conference with anyone to fix the prices of the Proposer or any other Proposer, or to fix any overhead, profit or cost element included in the Proposal, or of that of any other Proposer, or to secure any advantage against TxDOT or anyone interested in the proposed Agreement or Project; all statements contained in the Proposal are true; and, further, the Proposer has not, directly or indirectly, submitted its prices or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company, association, joint venture, limited liability company, organization, Proposal depository or any member, partner, joint venture member or agent thereof to effectuate a collusive or sham Proposal.

C. The Proposer will not, directly or indirectly, divulge information or data regarding the price or other terms of its Proposal to any other Proposer, or seek to obtain information or data regarding the price or other terms of any other Proposal, until after award of the Agreement or rejection of all Proposals and cancellation of the Request for Proposals.

In accordance with Section 635.112(f) of Title 23 of the Code of Federal Regulations, failure to submit this executed statement as part of the Proposal will make the Proposal nonresponsive and not eligible for award consideration.

* Initially capitalized terms not otherwise defined herein shall have the meaning set forth in the Instructions to Proposers or Agreement, as appropriate.

[signature page follows]

(Signature)	(Signature)
(Name printed)	(Name printed)
(Title)	(Title)

Subscribed and sworn to before me this ___ day of_____, 201___.

_____
Notary Public in and for said County and State

[Seal]

My commission expires:_____.

[Duplicate or modify this form as necessary so that it accurately describes the entity making the Proposal and so that it is signed on behalf of all partners, members or joint venturers of the Proposer.]

SPECIAL PROVISION

007---918

Legal Relations and Responsibilities

For this project, Item 7, "Legal Relations and Responsibilities" of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 7.4. Insurance and Bonds is voided and replaced by the following:

As specified in Article 3.4, "Execution of Contract," provide the Department with a Certificate of Insurance verifying the types and amounts of coverage shown in Table 1. The Certificate of Insurance must be in a form approved by the Texas Department of Insurance Any Certificate of Insurance provided shall be available for public inspection.

Table 1
Insurance Requirements

Type of Insurance	Amount of Coverage
Commercial General Liability Insurance	Not Less Than: $600,000 each occurrence
Business Automobile Policy	Not Less Than: $600,000 combined single limit
Workers' Compensation	Not Less Than: Statutory
All Risk Builder's Risk Insurance (For building-facilities contracts only)	100% of Contract Price

By signing the Contract, the Contractor certifies compliance with all applicable laws, rules, and regulations pertaining to workers' compensation insurance or legitimate alternates. This certification includes all subcontractors. Pay all deductibles stated in the policy. Subcontractors must meet the requirements of Table 1 either through their own coverage or through the Contractor's coverage.

Insurances must cover the contracted work for the duration of the Contract and must remain in effect until final acceptance. Failure to obtain and maintain insurance for the contracted work may result in suspension of work or default of the Contract. If the insurance expires and coverage lapses for any reason, stop all work until the Department receives an acceptable Certificate of Insurance.

The Workers' Compensation policy must include a waiver of subrogation endorsement in favor of the State.

For building-facilities contracts, provide All Risk Builder's Risk Insurance to protect the Department against loss by storm, fire or extended coverage perils on work and materials intended for use on the project including the adjacent structure. Name the Department under the Lost Payable Clause.

Provide a substitute Surety on the Contract bonds in the original full Contract amount within 15 days of notification if the Surety is declared bankrupt or insolvent, the Surety's underwriting limitation drops below the Contract amount or the Surety's right to do business is terminated by the State. The substitute Surety must be authorized by the laws of the State and acceptable to the Department. Work will be suspended until a substitute Surety is provided. Working day charges will be suspended for 15 days or until an acceptable Surety is provided, whichever is sooner.

Article 7.8. Hauling and Loads on Roadways and Structures is supplemented by the following:

D. Stockpiling of Materials. Do not store or stockpile material on bridge structures without written permission. If required, submit a structural analysis and supporting documentation by a licensed professional engineer for review by the Engineer. Permission may be granted if the Engineer finds that no damage or overstresses in excess of those normally allowed for occasional overweight loads will result to structures that will remain in use after Contract completion. Provide temporary matting or other protective measures as directed.

Article 7.14. Contractor's Responsibility for Work, Section B. Appurtenances is voided and replaced by the following:

B. Appurtenances.

1. **Unreimbursed Repair.** Except for destruction (not reusable) due to hurricanes, reimbursement will not be made for repair of damage to the following temporary appurtenances, regardless of cause:
   - signs,
   - barricades,
   - changeable message signs, and
   - other work zone traffic control devices.

   Crash cushion attenuators and guardrail end treatments are the exception to the above listing and are to be reimbursed in accordance with Section 7.14.B.2, "Reimbursed Repair."

   For the devices listed in this section, reimbursement may be made for damage due to hurricanes. Where the contractor retains replaced appurtenances after completion of the project, the Department will limit the reimbursement to the cost that is above the salvage value at the end of the project.

2. **Reimbursed Repair.** Reimbursement will be made for repair of damage due to the causes listed in Section 7.14.A, "Reimbursable Repair," to appurtenances (including temporary and permanent crash cushion attenuators and guardrail end treatments).

Article 7.15. Electrical Requirements, Section A. Definitions, Section 3. Certified Person is voided and replaced by the following:

> **3. Certified Person.** A certified person is a person who has passed the test from the TxDOT course TRF450, "TxDOT Roadway Illumination and Electrical Installations" or other courses as approved by the Traffic Operations Division. Submit a current and valid TRF certification upon request. On June 1, 2011, Texas Engineering Extension Service (TEEX) certifications for "TxDOT Electrical Systems" course will no longer be accepted. All TRF 450 certifications that have been issued for "TxDOT Roadway Illumination and Electrical Installations" course that expire before June 1, 2011 will be accepted until June 1, 2011.

Article 7.15. Electrical Requirements, Section A. Definitions, Section 4. Licensed Electrician is voided and replaced by the following:

> **4. Licensed Electrician.** A licensed electrician is a person with a current and valid unrestricted master electrical license, or unrestricted journeyman electrical license that is supervised or directed by an unrestricted master electrician. An unrestricted master electrician need not be on the work locations at all times electrical work is being done, but the unrestricted master electrician must approve work performed by the unrestricted journeyman. Licensed electrician requirements by city ordinances do not apply to on state system work.

The unrestricted journeyman and unrestricted master electrical licenses must be issued by the Texas Department of Licensing and Regulation or by a city in Texas with a population of 50,000 or greater that issues licenses based on passing a written test and demonstrating experience.

The Engineer may accept other states' electrical licenses. Submit documentation of the requirements for obtaining that license. Acceptance of the license will be based on sufficient evidence that the license was issued based on:

- passing a test based on the NEC similar to that used by Texas licensing officials, and
- sufficient electrical experience commensurate with general standards for an unrestricted master and unrestricted journeyman electrician in the State of Texas.

Article 7.19. Preservation of Cultural and Natural Resources and the Environment is supplemented by the following:

G. Asbestos Containing Material. In Texas, the Department of State Health Services (DSHS), Asbestos Programs Branch, is responsible for administering the requirements of the National Emissions Standards for Hazardous Air Pollutants, 40 CFR, Subpart M (NESHAP) and the Texas Asbestos Health Protection Rules (TAHPR). Based on EPA guidance and regulatory background information, bridges are considered to be a regulated "facility" under NESHAP. Therefore, federal standards for demolition and renovation apply.

Provide notice to the Department of demolition or renovation to the structures listed in the plans at least 30 calendar days prior to initiating demolition or renovation of each structure or load bearing member. Provide the scheduled start and completion date of structure demolition, renovation, or removal.

When demolition, renovation, or removal of load bearing members is planned for several phases, provide the start and completion dates identified by separate phases.

DSHS requires that notifications be postmarked at least 10 working days prior to initiating demolition or renovation. If the date of actual demolition, renovation, or removal is changed, the Department will be required to notify DSHS at least 10 days in advance of the work. This notification is also required when a previously scheduled (notification sent to DSHS) demolition, renovation or removal is delayed. Therefore, if the date of actual demolition, renovation, or removal is changed, provide the Engineer, in writing, the revised dates in sufficient time to allow for the Department's notification to DSHS to be postmarked at least 10 days in advance of the actual work.

Failure to provide the above information may require the temporary suspension of work under Article 8.4, "Temporary Suspension of Work or Working Day Charges," due to reasons under the control of the Contractor. The Department retains the right to determine the actual advance notice needed for the change in date to address post office business days and staff availability.

Article 7.20, **Agricultural Irrigation.** This Item is supplemented by the following:

Regulate the sequence of work and make provisions as necessary to provide for agricultural irrigation or drainage during the work. Meet with the Irrigation District or land owner to determine the proper time and sequence when irrigation demands will permit shutting-off water flows to perform work.

Unless otherwise provided on the plans, the work required by these provisions will not be paid for directly but shall be considered as subsidiary work pertaining to the various bid items of this contract.

SC 1 - LOCATION

The project is located in Frisco, Tx (Denton County) along Stonebrook Parkway, Lone Star Ranch Parkway, and Lebanon Road between F.M. 423 and Teel Road.

SC 2 - PROJECT DESCRIPTION

The work to be performed under the provisions of these Contract Documents consists of: Hike and Bike trail improvements, community sidewalk improvements, Phillips Creek Road and Vista Park lake development, landscape and irrigation.

SC 3 - COMPLIANCE WITH CONTRACT DOCUMENTS

The CONTRACTOR agrees to comply with the requirements of the Contract Documents, all approved modifications thereof, and additions and alterations thereto approved in writing by the OWNER. The burden of proof of such compliance shall be upon the CONTRACTOR to show that it has complied with the said requirements of the Contract Documents, approved modifications thereof and all approved additions and alterations thereto.

SC 4 - MINIMUM WAGE RATES

The prevailing wage rates as adopted by City Resolution are determined applicable for this project and are made a part of these Contract Documents. Not less than these rates must be paid on this project.

SC 5 - PROJECT SIGNS

The Contractor shall supply 0 project signs in accordance with the details attached at the end of these special conditions.

~~**SC 6 - WORK WITH OWN FORCES**~~

~~The CONTRACTOR shall perform with its own forces work of a value of not less than 50% of the contract amount.~~

SC 7 - FIELD OFFICE:

The CONTRACTOR [will not] be required to furnish a field office on this contract.

SC 8 - CLEAN-UP:

Project Number: STP 2011 (233) TE **Control: 0918-46-260**

County: Denton

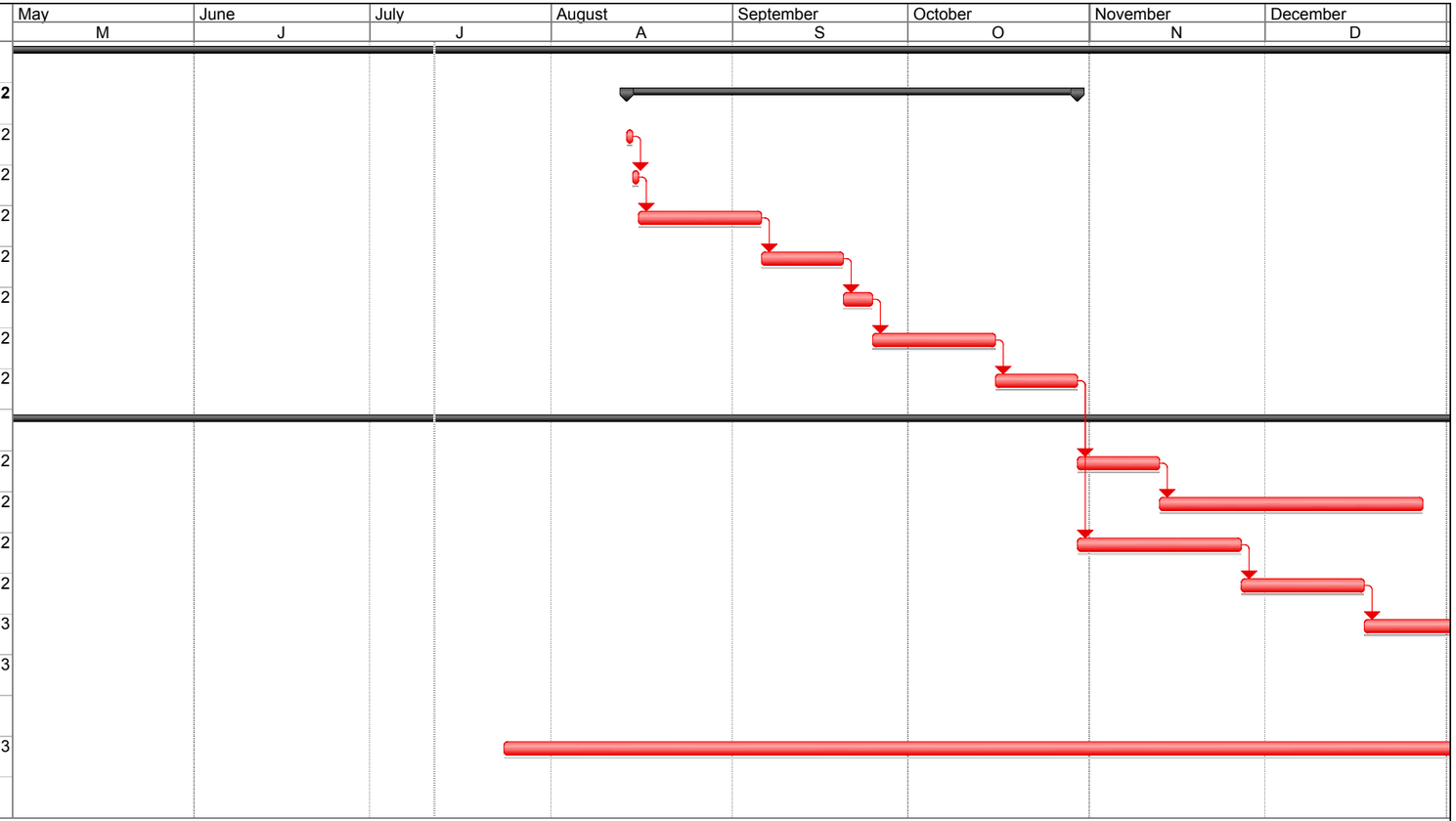
Highway: Lebanon Rd, Lone Star Ranch Pkwy, Stonebrook Pkwy

SP000-003 – Notice to all Bidders
SP000-004 – Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity
SP000-006 – Standard Federal Equal Employment Opportunity Construction Contract Specifications (Executive Order 11246)
SP000-009 – Certification of Nondiscrimination in Employment
SP000-011 – Department Division Mailing and Physical Address
SP000-1483 – Notice of Changes to U.S. Department of Labor Required Payroll Information
Disadvantaged Business Enterprises Requirements
SP000-1966 – Disadvantaged Business Enterprise in Federal Aid Contracts (000--2329) (000--2332)
SP000-2329 – Partnering
SP000-2332 – Schedule of Liquidated Damages
SP001-015 – Definition of Terms
SP004-017 – Scope of Work (003---033) (004---017)
SP005-004 – Control of Work
SP006-030 – Control of Materials
SP007-918 - Legal Relations and Responsibilities
SP008-119 – Prosecution and Progress
SP009-015 – Measurement and Payment (009---009)
S.P. to ITEM 100 (100-002)
S.P. to ITEM 164 (164-002)
S.P. to ITEM 166 (166-001)
S.P. to ITEM 247 (247-033)
S.P. to ITEM 260 (260-003)
S.P. to ITEM 300 (300-039)
S.P. to ITEM 316 (316-016)
S.P. to ITEM 360 (360-003)
S.P. to ITEM 420 (420-002)
S.P. to ITEM 421 (421-035)
S.P. to ITEM 440 (440-006)
S.P. to ITEM 441 (441-007)
S.P. to ITEM 442 (442-016)
S.P. to ITEM 464 (464-006)
S.P. to ITEM 465 (465-001)
S.P. to ITEM 476 (476-003)
S.P. to ITEM 500 (500-005)
S.P. to ITEM 502 (502-033)
S.P. to ITEM 506 (506-010)
S.P. to ITEM 643 (643-001)

Special Specifications – *Supplemental Specifications applicable to the Contract not covered by Standard TxDOT Specifications*

SECTION 03 36 00 - Special Concrete Finishes
SECTION 05 52 00 – Metal Railings
SECTION 09 90 00 – High-Performance Coatings
SECTION 12 93 00 – Site Furnishings
SECTION 13 12 13 – Floating Fountain Equipment

ID	PHILLIPS CREEK RANCH TIMELINE	Duration	Start	Finish
1	**Phillips Creek Ranch TxDOT Grant Schedule**			
2	**Milestone #1-(Phillips Creek Road)**		**Tue 8/14/12**	**Mon 10/29/12**
3	Set up traffic control	1 day	Tue 8/14/12	Tue 8/14/12
4	Erosion Control	1 day	Wed 8/15/12	Wed 8/15/12
5	Rough grading/excavation	21 days	Thu 8/16/12	Wed 9/5/12
6	Install Drainage Pipe	14 days	Thu 9/6/12	Wed 9/19/12
7	Install Drainage headwalls and inlets	5 days	Thu 9/20/12	Mon 9/24/12
8	Moisture conditioning/liming	21 days	Tue 9/25/12	Mon 10/15/12
9	Pavement	14 days	Tue 10/16/12	Mon 10/29/12
10	**Milestone #2-(Hike & Bike Trail & Landscape Improvements)**			
11	Fine grading	14 days	Tue 10/30/12	Mon 11/12/12
12	Install Irrigation	45 days	Tue 11/13/12	Thu 12/27/12
13	Construct Hike and Bike Trails	28 days	Tue 10/30/12	Mon 11/26/12
14	Install turf landscaping	21 days	Tue 11/27/12	Mon 12/17/12
15	Install ornamental and tree landscaping	33 days	Tue 12/18/12	Sat 1/19/13
16	Punch list items	21 days	Sun 1/20/13	Sat 2/9/13
17				
18	Total number of Calendar Days	180 days	Tue 7/24/12	Sat 1/19/13
19		0 days		



Project: PCR Test Project
Date: Thu 7/12/12

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

GEOTECHNICAL EXPLORATION
on

VISTA PARK – AMENITY CENTER,
VISTA PARK ROAD AND POND
HZ PROJECT NO. 013994-13
Off Lone Star Ranch Parkway
Frisco, Texas
ALPHA Report No. G110075

Prepared for:

HUITT-ZOLLARS, INC.
2600 Network Boulevard, Suite 420
Frisco, Texas 75034
Attention: Mr. Robert M. Stengele
March 18, 2011

Prepared By:

ALPHA TESTING, INC.
2209 Wisconsin Street, Suite 100
Dallas, Texas 75229

ALPHA TESTING
WHERE IT ALL BEGINS

Geotechnical
Construction Materials
Environmental
TBPE Firm No. 813

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March 18, 2011

Huitt-Zollars, Inc.
2600 Network Boulevard, Suite 420
Frisco, Texas 75034
Attention: Mr. Robert M. Stengele

Re: Geotechnical Exploration
Vista Park – Amenity Center,
Vista Park Road and Pond
HZ Project No. 013994-13
Off Lone Star Ranch Parkway
Frisco, Texas
ALPHA Report No. G110075

Attached is the report of the geotechnical exploration performed for the project referenced above. This study was authorized and performed in accordance with the Subconsultant Agreement between Huitt-Zollars, Inc. and ALPHA Testing, Inc dated November 22, 2010.

This report contains results of field explorations and laboratory testing and an engineering interpretation of these with respect to available project characteristics. The results and analyses were used to develop recommendations to aid design and construction of foundations and pavement.

ALPHA TESTING, INC. appreciates the opportunity to be of service on this project. If we can be of further assistance, such as providing materials testing services during construction, please contact our office.

STATE OF TEXAS
THEODORE A. JANISH
82418
LICENSED
PROFESSIONAL ENGINEER
3/18/11

Sincerely,

ALPHA TESTING, INC.

Theodore A. (Tony) Janish, P.E.
Principal

for Brian A. Powell, P.E.
Vice President

TAJ/BAP/lf
Copies: (3) Client

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On

ALPHA REPORT NO. G110075

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1.0 PURPOSE AND SCOPE

The purpose of this geotechnical exploration is to evaluate some of the physical and engineering properties of subsurface materials at the subject site with respect to formulation of appropriate geotechnical design parameters for the proposed construction. The field exploration was accomplished by securing subsurface samples from widely spaced test borings performed at the proposed construction site. Engineering analyses were performed from results of the field exploration and results of laboratory tests performed on representative samples.

Also included are general comments pertaining to reasonably anticipated construction problems and recommendations concerning earthwork and quality control testing during construction. This information can be used to evaluate subsurface conditions and to aid in ascertaining construction meets project specifications.

Recommendations provided in this report were developed from information obtained in the test borings depicting subsurface conditions only at the specific boring locations and at the particular time designated on the logs. Subsurface conditions at other locations may differ from those observed at the boring locations. The scope of work may not fully define the variability of subsurface materials that is present on the site. The nature and extent of variations between borings may not become evident until construction. If significant variations then appear evident, our office should be contacted to re-evaluate our recommendations after performing on-site observations and possibly other tests.

2.0 PROJECT CHARACTERISTICS

It is proposed to construct a new Amenity Center, a new pond and an access road (Vista Park Road) to the amenity center on site located on the west side of Lone Star Ranch Parkway at Phillips Creek Ranch Boulevard in Frisco, Texas. A site plan illustrating the general outline of the property is provided as Figure 1, the Boring Location Plan, in the Appendix of this report. At the time the field exploration was performed, the site was relatively open with scattered trees. According to the site plan prepared by Huitt-Zollars, Inc. (ref: Boring Location Plan prepared by Huitt-Zollars, Inc. dated January 2011) the site topography generally slopes away from the high point located in the southwest portion of the site with a maximum change in surface elevation of about 22 ft (Elev. 614 to 592).

Present plan provide for the construction of a new amenity center with an assocaited swimming pool, a pavilion, a pond and an access road to the amenity center. Based on our conversations with the project team, it is anticipated the new amenity center will be supported using a drilled pier foundation system with post-construction foundation movements limited to about 1 inch. Based on the grading plan prepared by TBG dated February 18, 2010, the proposed final grade for the amenity center building is established at Elev. 606.75. Fills of up to about 9 ft and cuts of less then 1 ft are required to achieve the proposed final grades. The bottom of the proposed pond is planned at Elev. 583 and cuts of up to 15 ft are required for the pond area.

Vista Park Road will be constructed using Portland cement concrete. Based on current available information, we understand the speed limit for this road will be 30 mph. This subject road study was performed in accordance with the City of Frisco, Texas Ordinance Nos. 84-02-06 and 84-02-07 (reference Section 8 – Subgrade Design Requirements: Engineering Design and Protocol for Pavements within the Eagle Ford formation in the City of Frisco), hereafter referred to as "City Ordinance."

3.0 FIELD EXPLORATION

Subsurface conditions on the site were explored by drilling a total of nine (9) test borings in general accordance with ASTM D 420 to a depth of up to 25 ft using standard rotary drilling equipment. Borings 1, 2 and 3 were drilled to a depth of about 25 each within the planned pond area, Borings 4, 5 and 6 were drilled to a depth of about 12 ft each along the proposed access road to the amenity center and Borings 7, 8 and 9 were drilled to a depth of about 25 each for the planned amenity center building. The approximate location of each test boring is shown on the Boring Location Plan, Figure 1, enclosed in the Appendix of this report. Details of drilling and sampling operations are briefly summarized in Methods of Field Exploration, Section A-1 of the Appendix.

Subsurface types encountered during the field exploration are presented on the Log of Boring sheets included in the Appendix of this report. The boring logs contain our Field Technician's and Engineer's interpretation of conditions believed to exist between actual samples retrieved. Therefore, the boring logs contain both factual and interpretive information. Lines delineating subsurface strata on the boring logs are approximate and the actual transition between strata may be gradual.

4.0 LABORATORY TESTS

Selected samples of the subsurface materials were tested in the laboratory to evaluate their engineering properties as a basis in providing recommendations for foundation design and earthwork construction. A brief description of testing procedures used in the laboratory can be found in Methods of Laboratory Testing, Section B-1 of the Appendix. Individual test results are presented on the Log of Boring sheets enclosed in the Appendix.

5.0 GENERAL SUBSURFACE CONDITIONS

Based on the available surface geology maps the site appears to be located in area of undivided surfacial deposits underlain by the Eagle Ford Formation. The surficial deposits consist predominantly of clay, sand, silts, and gravel. The Eagle Ford formation is composed of highly expansive shaly clays, clay shale and shale with occasional thin strata of sandstone, limestone and bentonite. Shale is generally present at greater depths.

Subsurface materials consist generally of clay (CH) to depths of about 2 to 8 ft below existing grade underlain by shaly clay (CH), clay shale and/or shale. Based on visual observations, the upper 1 ft of clay material in Boring 8 is considered fill. Clay shale was encountered in Borings 1, 2, 3, 8 and 9 at depths of about 12 to 23 ft and extended to depths of about 20 ft to at least 25 ft

the boring termination depth. Gray shale was noted in Boring 1 at a depth of about 20 ft and extended to the boring termination depth of about 25 ft. The letters in parenthesis represent the soils' classification according to the Unified Soil Classification System (ASTM D 2488). More detailed stratigraphic information is presented on the Log of Boring Sheets attached to this report.

Most of the subsurface materials are relatively impermeable and are anticipated to have a relatively slow response to water movement. Therefore, several days of observation will be required to evaluate actual groundwater levels within the depths explored. Also, the groundwater level at the site is anticipated to fluctuate seasonally depending on the amount of rainfall, prevailing weather conditions and subsurface drainage characteristics.

During field explorations, no free groundwater was noted on drilling tools or in open boreholes immediately upon completion of the borings. However, it is common to detect seasonal groundwater in fill materials, from natural fractures within the clayey matrix, near the soil/rock (shaly limestone) interface, or from fractures in the rock (shale), particularly during or after periods of precipitation. If more detailed groundwater information is required, monitoring wells or piezometers can be installed.

Further details concerning subsurface materials and conditions encountered can be obtained from the Log of Boring sheets provided in the Appendix of this report.

6.0 DESIGN RECOMMENDATIONS - AMENITY CENTER AND PAVILION (BORINGS 7, 8 AND 9)

The following design recommendations were developed on the basis of the previously described Project Characteristics (Section 2.0) and General Subsurface Conditions (Section 5.0). If project criteria should change, including structure locations on the site, our office should conduct a review to determine if modifications to the recommendations are required. Further, it is recommended our office be provided with a copy of the final plans and specifications for review prior to construction.

The following design criteria given in this report were developed assuming final grades as shown on referenced plans (ref: Boring Location Plan prepared by Huitt-Zollars, Inc. dated January 2011 and grading plan prepared by TBG dated February 18, 2010). Cutting and filling on the site other than assumed can alter the recommended foundation design parameters. Therefore, it is recommended our office be contacted before performing other cutting and filling on site to verify appropriate design parameters are utilized for final foundation design.

6.1 Drilled and Under-reamed Pier Foundation System

Our findings indicate the structural frame and walls for the proposed amenity center building and pavilion could be supported using a system of drilled and under-reamed piers. It is recommended these piers bear at least 18 ft below the existing grade or final grade, whichever is deeper. Piers can be dimensioned using a net allowable end bearing pressure of 4.5 kips per sq ft and no skin friction component of resistance. The above

bearing capacity contains a factor of safety of at least 3 considering a general bearing capacity failure. Normal elastic settlement of piers under loading is estimated to be less than about 1 inch.

Each pier shaft should be reinforced with suitable tension steel over its entire length to adequately resist potential uplift (tensile) forces due to potential soil swell (soil-to-pier adhesion) along the shaft, from post construction heave and other uplift forces applied by structural loadings. The magnitude of uplift adhesion due to soil swell along the pier shaft cannot be defined accurately and can vary according to the actual in-place moisture content of the soils during construction. It is estimated this uplift adhesion will not exceed about 2.2 kips per sq ft. This soil adhesion is approximated to act uniformly over the upper 12 ft of the pier shaft. Uplift adhesion due to soil heave can be neglected over the portion of the pier shaft in contact with any select, non-expansive material.

The uplift force due to swelling of active clays should be resisted by the underreamed portion of the pier. The underreamed portion should be at least 2 and not exceeding 3 times the diameter of the shaft. The minimum clear spacing between edges of adjacent piers should be at least one (1) under-ream diameter.

All grade beams connecting piers should be formed and not cast in earthen trenches. Grade beams should be formed with a nominal 12-inch void at the bottom. Commercially available cardboard box forms (cartons) are made for this purpose. The cardboard cartons should extend the full length and width of the grade beams. Prior to concrete placement, the cartons should be inspected to verify they are firm, properly placed, and capable of supporting wet concrete. Some type of permanent soil retainer, such as pre-cast concrete panels, must be provided to prevent soils adjacent to grade beams from sloughing into the void space at the bottom of the grade beams. Additionally, backfill soils placed adjacent to grade beams must be compacted as outlined in Section 9.3 of this report.

6.2 Floor Slabs – Pier Supported

Floor slabs constructed at the proposed final grades as shown on the referenced grading plans could experience soil-related potential seasonal movements of about 6 inches. This potential seasonal movement was estimated in general accordance with methods outlined by Texas Department of Transportation (TxDOT) Test Method Tex-124-E, results of absorption swell tests, and engineering judgment and experience. Estimated movements were calculated assuming the moisture content of the in-situ soil within the normal zone of seasonal moisture content change varies between a "dry" condition and a "wet" condition as defined by Tex-124-E. Also, it was assumed a 1 psi surcharge load from the floor slabs acts on the subgrade soils. Movements exceeding those predicted above could occur if positive drainage of surface water is not maintained or if soils are subject to an outside water source, such as leakage from a utility line or subsurface moisture migration from off-site locations.

Since the above referenced movements are normally considered excessive, the most positive floor system for the building supported on piers is a slab suspended completely above the existing expansive soils. At least 12 inches of void space should be provided between the bottom of the floor slabs and top surface of the underlying expansive clays. A ventilated and drained crawl space is preferred. Provisions should be made for (a) adequate drainage of the under-floor space and (b) differential movement of utility lines.

If some slab movement is tolerable (about 1 inch), an alternate method is for the floor system of the building to consist of a concrete slab designed to bear uniformly on improved soils. Subgrade improvement options to reduce potential for floor slab movements include over-excavating a portion of the existing clayey soils and either 1) backfilling with a combination of moisture-conditioned soil followed by placement of select, non-expansive material or 2) utilizing the procedures of Water Pressure Injection (WPI) in conjunction with placement of select, non-expansive material. The extent (and depth) of these subgrade improvement methods are summarized below in Table A and are discussed in more detail in Sections 6.2.1 and 6.2.2. In choosing these methods of floor slab movement reduction, the Owner is accepting some post construction seasonal movement of the floor slab (1 inch).

TABLE A
Resulting Estimated Potential Seasonal Movement = 1 inch

SUBGRADE IMPROVEMENT METHOD TO REDUCE POTENTIAL SEASONAL MOVEMENTS TO 1 INCH	SELECT, NON-EXPANSIVE MATERIAL, FT
Minimum Thickness of Select, Non-Expansive Material In Conjunction with 12 ft of Moisture-Conditioned Soil below Floor Slabs, ft (See Section 6.2.1)	2
Minimum Thickness of Select, Non-Expansive Material In Conjunction with 12 ft of Water Pressure Injection (WPI) below Floor Slabs, ft (See Section 6.2.2)	2

In order to enhance performance of the slab underlain by select non-expansive material at this site, every reasonable precaution must be taken to inhibit infiltration of groundwater and surface water into select material. Past problems have occurred with slabs underlain by even extensive select material thicknesses when poor drainage causes saturation of the select material. In this instance, the select material can act as a reservoir for water, and cause swelling beyond normally assumed amounts in the underlying clays. Further details are provided in Section 6.6, Drainage, of this report to reduce the probability of infiltration of water into select material.

If a soil-supported floor slab is utilized for the planned building, a "floating" (fully ground supported, and not structurally connected to walls or foundations) floor slab is preferred. This reduces the risk of cracking and displacement of the floor slab due to differential

movements between the slab and foundations. A floor slab doweled into perimeter grade beams can develop a plastic hinge (crack) parallel to and approximately 5 to 10 ft inside the building perimeter. The structural engineer should determine the need for connections between the slab and structural elements and determine if control joints to limit cracking are needed. A properly designed and constructed moisture barrier should be placed between the slab and subgrade soils to retard moisture migration through the slab.

6.2.1 Subgrade Improvement Utilizing Moisture-Conditioned Soil

Movement of the floor slabs could be reduced to about 1 inch by placing at least 2 ft of select, non-expansive material between the bottom of floor slabs and the top surface of 12 ft of moisture-conditioned soil. Select, non-expansive fill is described in Section 9.3 below.

Moisture conditioning consists of processing and compacting the specified minimum thickness of on-site soil at a "target" moisture content approximated to be at least 5 percentage points above the material's optimum moisture content as determined by the standard Proctor method (ASTM D 698). The moisture-conditioned soil should be placed in 8-in thick loose lifts and compacted to a dry density of 93 to 97 percent of standard Proctor maximum dry density. Moisture conditioning of the on-site soil should extend throughout the entire building pad area and at least 5 ft beyond the perimeter of the building. In major entrance areas, the moisture conditioning process should extend at least 10 ft beyond the perimeter of the building. However, select material should not extend beyond the building limits. If flatwork or paving is not planned adjacent to the structure (i.e. above the moisture-conditioned soils), a moisture barrier consisting of a minimum of 6 mil plastic sheeting with 8 to 12 inches of soil cover should be provided above the moisture conditioned soils. Moisture-conditioned soils should be maintained in a moist condition prior to placement of the required thickness of select, non-expansive material, plastic sheeting or flatwork.

The resulting estimated potential seasonal movements (1 inch) was calculated assuming the moisture content of the moisture-conditioned soil varies between the "target" moisture content and the "wet" condition while the deeper undisturbed in-situ soil within the normal zone of seasonal moisture content change varies between the "dry" condition and the "wet" condition as defined by methods outlined in TxDOT Test Method Tex-124-E.

Please note, it is the intent of the moisture-conditioning process described above to reduce the free swell potential of the moisture-conditioned soil to 1 percent or less. Additional laboratory tests (i.e., standard Proctors, absorption swell tests, etc.) should be conducted during construction to verify the "target" moisture content for moisture-conditioning (estimated at 5 percentage points above the material's optimum moisture content as defined by ASTM D 698) is sufficient to reduce the free swell potential of the processed soil to 1 percent or less.

In addition, it is recommended samples of the moisture-conditioned material be routinely obtained during construction to verify the free swell of the improved material is 1 percent or less.

Installation of moisture-conditioned clays should be monitored and tested on a full-time basis by a representative of ALPHA TESTING, INC., to verify the soils tested were placed with the proper lift thickness, moisture content, and degree of compaction.

6.2.2 Subgrade Improvement Utilizing Water Pressure Injection (WPI)

An alternate movement reduction method utilizes the procedures of Water Pressure Injection (WPI) in conjunction with placement of select, non-expansive material. The improvement procedures outlined below, again, will not eliminate future movement of the slabs (1 inch).

Improvement Procedures:

1. Following removal of the necessary thickness of on-site expansive soils to allow for placement of at least 2 ft of select, non-expansive material, the exposed subgrade of the building pad should be water pressure injected (WPI) to a depth of 12 ft below the bottom of the select fill. The water pressure injection should extend throughout the entire building pad area and at least 5 ft beyond the perimeter of each building. Recommended specifications for WPI are attached to this report in the appendix. Select, non-expansive fill is described in Section 9.3 below.

2. In major entrance areas, WPI should extend at least 10 ft beyond the perimeter of the building. The select material should preferably not extend beyond the building limits. If flatwork or paving is not planned adjacent to each structure (i.e. above the injected soils), a moisture barrier consisting of a minimum of 6 mil plastic sheeting with 8 to 12 inches of soil cover should be provided above the moisture conditioned soils. Injected soils should be maintained in a moist condition prior to placement of the required thickness of select, non-expansive material, plastic sheeting or flatwork.

Performance of post-injection swell testing and moisture content determinations should be employed as final acceptance criteria in engineering analysis to examine accomplishment of intended objectives of the injection treatment. Maximum benefit of these movement reduction procedures can be achieved by employing ALPHA TESTING, INC. to observe, monitor and test the entire process. Construction specifications for the water pressure injection process are provided in the Appendix of this report.

The purpose of the above procedure is to pre-swell the existing soils. Satisfactory completion of the injection process is achieved when the desired moisture content and

abatement of swell in the injected subgrade clay soils are reached. Acceptance criteria for water pressure injection should be based upon obtaining an average free swell of 1 percent or less in the injected zone. Performance of post-injection swell testing and moisture content determinations should be employed as final acceptance criteria in engineering analysis to examine accomplishment of intended objectives of the injection treatment.

The resulting estimated potential seasonal movements (about 1 inch) were calculated assuming the average free swell of the injected soils does not exceed 1 percent. Further, it is assumed the moisture content of the soil below the injected zone and within the normal zone of seasonal moisture content change varies between a "dry" condition and a "wet" condition as defined by Tex-124-E.

6.3 Swimming Pool, Pool Deck Area and Flatwork

Based on the conditions encountered in the test borings, the pool and pool deck slabs constructed at the proposed final grades could experience soil-related potential seasonal movements on the order of about 6 inches. If the above referenced potential movement is considered excessive, potential seasonal movements can be reduced by improving subsurface soil conditions. Subgrade improvements to reduce potential movement to 1 inch are included in Section 6.2.

6.4 Seismic Considerations

The Site Class for seismic design is based on several factors that include soil profile (soil or rock), shear wave velocity, and strength, averaged over a depth of 100 ft. Since our borings did not extend to 100-foot depths, we based our determinations on the assumption that the subsurface materials below the bottom of the borings were similar to those encountered at the termination depths of the deepest borings. Based on Table 1613.5.2 of the 2006 International Building Code, we recommend using Site Class C (very dense soil and soft rock) for seismic design at this site.

6.5 Retaining Walls

Based on the current available information, retaining walls are planned to the west of the proposed lap pool and near the leisure pool. Based on the grading plan prepared by TBG dated February 18, 2010, the maximum height of the retaining wall is about 4 ft. Retaining wall recommendations are included below.

6.5.1 Lateral Earth Pressures

Retaining walls should be designed to resist the expected lateral earth pressures. The magnitude of lateral earth pressure against retaining walls is dependent on the method of backfill placement, type of backfill soil, drainage provisions, and type of wall (rigid or yielding) after placement of the backfill. Experience demonstrates when a wall is held rigidly against horizontal movement (restrained

at the top), the lateral pressure (at-rest lateral earth pressure) against the wall is greater than the normally assumed active pressure. Yielding walls (rotation at the top of at least 0.1 percent of the wall height) and walls not sensitive to some movements can be designed for active earth pressures (k_a). Rigid walls should be designed using the higher at-rest lateral earth pressures (k_o). Walls should be designed using the equivalent fluid pressures provided in the table below, considering a triangular distribution and assuming a ground surface extending back at a slope not steeper than 1 vertical to 5 horizontal (Table B). The equivalent fluid pressures provided do not include a factor of safety.

TABLE B
LATERAL EARTH PRESSURE
Ground Surface Extending Back from the Top of the Wall is Sloped Upward at 1 Vertical to 5 Horizontal or Flatter

Material	Condition	Equivalent Fluid Pressure, pcf	
		Drained	Undrained including Hydrostatic Pressure
Free Draining Granular Soil Φ=30°, γ_T =125 pcf	At-Rest, k_o=0.65	82	103
	Active, k_a=0.43	54	90
Compacted On-site Clayey Soil, Φ=12°, γ_T =125 pcf	At-Rest, k_o=0.9	--	119
	Active, k_a=0.8	--	113

Free draining granular backfill should consist of a clean, non-plastic, relatively well-graded granular soil consisting of sand, gravel, or a sand and gravel mixture, with less than 5 percent finer than the No. 200 sieve size. To reduce surface water seepage into the free draining backfill, the top 1-ft of the backfill should consist of on-site clay soil with a plasticity index of at least 25. To utilize the active and at-rest pressures above, the free draining granular backfill (if used) should extend outward at least 2 ft from the base of the wall and then extend upward on a 1 horizontal to 2 vertical slope. The free draining granular backfill should be separated from the adjacent native soils using a filter fabric (Mirafi 140N, or equivalent) to prevent intrusion of native soils into the free draining granular backfill.

Complete drainage of the free draining granular backfill should be provided to prevent the development of hydrostatic pressures behind the wall. A typical drainage system could consist of perforated PVC pipes placed in filter trenches excavated parallel to the base of the walls for their entire length. The drain pipes should be positioned at a depth lower than the bottom elevation of the wall and should also be wrapped with filter fabric (Mirafi 140N, or equivalent). A drainage

system is beneficial regardless of the type of backfill used behind the wall. For cohesive wall backfill, a vertical drainage layer immediately behind the wall (such as free-draining sand or gravel as described above, or a manufactured drainage medium) could be utilized. As a minimum weep holes should be provided for freestanding walls, although weep holes by themselves will likely not be adequate to provide sufficient drainage to prevent occasional buildup of hydrostatic pressure.

Lightweight, hand-controlled vibrating plate compactors are recommended for compaction of backfill adjacent to walls to reduce the possibility of increases in lateral pressures due to over-compaction. Heavy compaction equipment should not be operated near the walls. Also, compaction of backfill soils behind walls should not exceed 100 percent standard Proctor maximum dry density (ASTM D 698) to further limit lateral earth pressures against walls.

The lateral earth pressures above do not include the effects of surcharge loading on the wall due to sloping backfill except as noted in Table B, or from other loads near the walls. Surcharge loads should be multiplied by the appropriate lateral earth pressure coefficient from Table B above and applied as a uniform lateral load over the full height of the wall.

6.5.2 Retaining Wall Foundations

The proposed retaining walls can be supported using a spread footing foundation system bearing on either native clay soils or fill material placed as recommended in Section 9.3. For walls of 4 ft in height **or** less, results of global stability analyses (presented later in this report below) indicate foundations for the retaining walls should bear a minimum depth of at least 1.5 ft below finished grade (as measured from the toe of the wall).

The minimum foundation depth provided above is based on the expectation the final ground surface behind the wall will be sloped at 1 vertical to 5 horizontal (1V:5H) or flatter. The recommended bearing depths provided above are necessary for global stability of the planned walls for wall heights of 4 ft or less. Greater bearing depths could be required based on the overall wall design requirements. The structural engineer should review the recommended bearing depths to verify the walls are sufficiently designed to resist sliding, overturning, etc.

A net allowable bearing pressure of 1.5 kips per sq ft can be considered for foundations bearing on either native clayey soil or new fill soils placed as recommended in Section 9.3 of this report. Foundations for walls should have a least dimension of 24 inches in width for bearing capacity considerations. This allowable bearing capacity is based on a factor of safety of at least 2 against a bearing capacity failure.

Soil supported walls bearing on foundations as described above at this site could experience potential seasonal movements on the order of about 5 inches. This potential seasonal movement was estimated in general accordance with methods outlined by Texas Department of Transportation (TxDOT) Test Method Tex-124-E, using results from absorption swell test and engineering judgment and experience. Estimated movements were calculated assuming the moisture content of the in-situ soil within the normal zone of seasonal moisture content change varies between a "dry" condition and a "wet" condition as defined by Tex-124-E. Movements exceeding those predicted above could occur if positive drainage of surface water is not maintained or if soils are subject to an outside water source, such as leakage from a utility line or subsurface moisture migration from off-site locations.

Retaining walls that are sensitive to potential seasonal movements could be supported using drilled piers as recommended in Section 6.1.

Resistance to sliding will be developed by friction along the base of the footing and passive earth pressure acting on the vertical face of the footing and a key installed in the base of the footing. It is recommended a coefficient of friction of 0.3 be used along the bottom of the footing. The available passive earth resistance on the vertical face of the toe of the footing and a possible key installed in the base of the footing may be calculated using an allowable uniform passive earth pressure of 750 psf for footings or keys bearing laterally against undisturbed vertical cuts in compacted clayey fill soils or native clayey soils. Passive resistance on the vertical face of the footing within 2 ft of the final site grade should be neglected.

It is recommended to carefully monitor the subsurface conditions along the proposed retaining walls during construction on a full time basis. Unsuitable materials encountered at the foundation bearing level should be removed and replaced with either lean concrete (2,000 psi at 28 days) or structural concrete. All wall footings should be excavated and concrete placed within 48 hours.

6.5.3 Global Stability Analysis – Retaining Walls

Stability analyses for the retaining walls were performed for this study using the GSTABL7 with STEDwin computer program, which is distributed by Gregory Geotechnical Software. The modified Bishop method of analysis was used. The GSTABL7 program generates numerous trial failure surfaces (within specified geographic limits), computes a factor of safety for each trial surface, and reports the lowest safety factors for stability. The factor of safety against global wall is defined as the ratio of resisting forces (or moments) to driving forces. A factor of safety of 1.5 is customarily used for similar retaining walls and slopes in a residential setting.

Residual effective stress conditions (long term, drained conditions) were analyzed for this study. Effective stress parameters for clayey soils (fill and natural) were was conservatively estimated based on previous experience. Shear strength parameters used in the stability analyses are presented in Table C below:

TABLE C
RESIDUAL DRAINED SHEAR STRENGTH PARAMETERS
C' – Cohesion and Φ' – Friction Angle

Material	C', psf	Φ', deg
Clayey Fill Soil	200	12
Native Clay/Shaly Clay (CH)	250	16

Stability analyses were performed for a retaining wall at Cross Section 1 as shown on the Boring Location Plan, Figure 1. Results of our stability analyses indicate the new retaining wall with a height of 4 ft or less should bear at a minimum depth of 1.5 ft below finished grade as measured at the toe of the wall to provide a factor of safety of at least 1.5 considering the global stability of the retaining wall.

Results of typical stability analyses performed during this study are presented for the previously referenced Cross Section 1, as Figure 5, in the Appendix of this report.

6.6 Drainage

Adequate drainage should be provided to reduce seasonal variations in moisture content of foundation soils. All pavement and sidewalks within 5 ft of the structure should be sloped away from the structure to prevent ponding of water around the foundations. Final grades within 5 ft of the structure should be adjusted to slope away from the structure at a minimum slope of 2 percent. **Maintaining positive surface drainage throughout the life of the structure is essential.**

In areas with pavement or sidewalks adjacent to the new structure, a positive seal must be maintained between the structure and the pavement or sidewalk to minimize seepage of water into the underlying supporting soils. Post-construction movement of pavement and flatwork is common. Normal maintenance should include examination of all joints in paving and sidewalks, etc. as well as resealing where necessary.

Several factors relate to civil and architectural design and/or maintenance that can significantly affect future movements of the foundation and the floor slab:

1. Preferably, a complete system of gutters and downspouts should carry runoff water a minimum of 5 feet from the completed structure.

2. Large trees and shrubs should not be allowed closer to the foundations than a horizontal distance equal to roughly one-half of their mature height due to their significant moisture demand upon maturing.

3. Moisture conditions should be maintained "constant" around the edge of the slab. Ponding of water in planters, in unpaved areas, and around joints in paving and sidewalks can cause slab movements beyond those predicted in this report.

4. Planter box structure placed adjacent to the building should be provided with a means to assure concentrations of water are not available to the subsoil stratigraphy.

5. Architectural design of the floor slab should avoid additional features such as wing walls as extensions of the slab.

6. The root systems from existing trees at this site will have dried and desiccated the surrounding clay soils, resulting in soil with near-maximum swell potential. Clay soils surrounding tree root mats in flatwork areas should be removed to a depth of 3 ft and compacted in-place with moisture and density control as described in Section 9.3 of this report, below.

Trench backfill for utilities should be properly placed and compacted as outlined in Section 9.3 of this report and in accordance with requirements of local City standards. Since granular bedding backfill is used for most utility lines, the backfilled trench should be prevented from becoming a conduit and allowing an access for surface or subsurface water to travel toward the new structure. Concrete cut-off collars or clay plugs should be provided where utility lines cross building lines to prevent water from traveling in the trench backfill and entering beneath the structure.

7.0 DESIGN RECOMMENDATIONS - VISTA PARK ROAD (BORINGS 4, 5, AND 6)

The following design criteria given in this report were developed assuming final grades are as shown on referenced plans (ref: Boring Location Plan prepared by Huitt-Zollars, Inc. dated January 2011). Cutting and filling on the site other than assumed can alter the recommended foundation design parameters. Therefore, it is recommended our office be contacted before performing other cutting and filling on site to verify appropriate design parameters are utilized for final foundation design.

7.1 Weighted Average Swell Test Results

A total of 6 swell tests were performed on existing clayey soils for this project (two swells per boring within the upper 10 ft of the pavement subgrade, at a vertical stress of 200 psf, ASTM D4546). Swell test results are provided on the Swell Test Data sheet, Figure 2 included in Appendix B-1 of the report. The weighted average swell

values presented below in Table D were calculated at each boring using the swell values from the particular boring and swell values from similar soil strata in other borings.

Table D
Weighted Average of Swell for Each Boring

Boring No.	Weighted Average Swell, %
B-4	8.5
B-5	6.1
B-6	8.1

The following assumptions were made in calculating the above tabulated weighted average swells:

1. Weighted average swell is calculated within 10 ft below final grade.
2. Where swell test data was not available, percent swell was used based on swell tests from similar soils considering color, consistency, and existing moisture content of the strata, typically from the nearest boring containing such soil.

Provided herein is a sample calculation for estimating the weighted average swell below final grade at Boring1.

Boring 4 - (0'-4'@8.1% + 4'-10'@8.8%)/ 10' = 8.5%

7.2 Pavement Subgrade Treatment

Based on the existing subsurface conditions encountered in the test borings and results of the laboratory tests, the current average swell potential (mean swell) within the upper 10 ft at this site is about 7.5 percent, with a standard deviation of about 1.3. Based on this mean percent swell **plus one standard deviation** (7.6 + 1.3 = 8.9 percent) and considering Figure 8.1 in Section 8.02 of the City Ordinance, the recommended subgrade treatment along the proposed road is 5.5 ft as measured from final grade.

The moisture treatment and moisture barrier (10 mil poly sheeting) should be performed in accordance with Section 8.02 of the City Ordinance. Any additional fill required below the moisture treated soils should be compacted to a minimum dry density of 95 percent of standard Proctor maximum dry density (ASTM D 698). The compacted moisture content of the clays during placement should be a minimum of 4 percentage points above standard Proctor optimum moisture.

7.3 Lime Treatment of Final Pavement Subgrade

Following final grading, the exposed subgrade material is expected to consist of brown clay. To permit correlation between information from test borings and actual subgrade conditions exposed during construction, a qualified Geotechnical Engineer should be retained to verify conditions are as anticipated and provide subgrade monitoring and testing during construction. If there is any change in project criteria or conditions during construction, the recommendations contained in this report should be reviewed by our office, and modified or verified in writing.

After achieving final subgrade elevation in paving areas (following completion of the moisture conditioning required by the City Ordinance, as discussed in Section 6.2), the upper 8 inches of subgrade should be lime stabilized as discussed below.

Based on our analysis of laboratory test results and the requirements of the City Ordinance, the brown clay subgrade soils along the entire proposed road should be treated with a total of 10.5 percent lime by dry weight. The test results to determine lime content and the corresponding minimum design criteria in Section 8.01 of the City Ordinance are presented in Table E below.

TABLE E
Lime Content Determination Test Results and Minimum Design Criteria for Brown Clay

	Test Results Using 9.5 Percent Lime	Design Criteria per City Ordinance
pH	12.4 (at 6 percent lime)	Minimum 12.4
Swell Potential	0.03 percent	Maximum 1.0 percent

Lime stabilization of the pavement subgrade soil should be performed in accordance with Section 8.02 and 8.03 of the City Ordinance.

A description of the testing procedures used for lime content determination is included in Appendix B of this report. Lime series tests (Eades-Grimm Method) performed on the dark brown clay (Figure 3) are attached at the end of this report. Standard Proctor tests (ASTM D 698) performed on dark brown clay is shown on Figure 4.

7.4 Soluble Sulfate Test Results

A total of three (3) soluble sulfate tests were performed for this project. Test results are presented in Table F below.

TABLE F
SOLUBLE SULFATE TEST RESULTS

Boring No.	Sample Depth, ft below original grade	Material Type	Soluble Sulfate Concentration, mg/Kg (ppm)
B-4	0-2	Brown Clay	161
B-5	2-4	Tan and Gray Shaly Clay	269
B-6	0-2	Brown Clay	14

Based on the results of laboratory testing, special subgrade treatments due to potential sulfate concerns are not required. It should be noted that concentrations of soluble sulfates in soil are typically very localized and concentrations in other areas of the site could vary significantly.

8.0 DESIGN RECOMMENDATIONS – POND (BORINGS 1, 2 and 3)

Based on the site plan prepared by Huitt-Zollars, Inc. dated January 2011, the bottom of the pond will be Elev. 583. Cuts of up to about 15 ft will be required in the pond area.

8.1 Pond

Review of subsurface information (Borings 1, 2 and 3) indicates clay and shaly clay will be encountered within pond excavations. In addition, clay shale and/or shale seams within the shaly clay stratum may be encountered within the proposed pond depth. These materials can generally be excavated using standard excavation equipment.

Based upon our previous experience, the claycy soils encountered at the site are anticipated to be relatively impermeable and should retain water with minor seepage. In addition, additional seepage could be expected through desiccation cracks in the clays and clay shale and other natural fractures within the natural clays. Close observations during excavation should be performed by ALPHA to determine if any exposed fractures are present that would require the use of a clay liner. It is recommended the exposed clayey material at the pond sides and bottom be scarified to a depth of at least 8 inches and re-compacted (re-processed). The compacted moisture content of the re-processed clay during placement should be within the range of 2 to 6 percentage points above optimum.

No significant de-watering problems are anticipated during pond excavations. However, some perched groundwater could be encountered in portions of the excavation. Any water seepage encountered during construction should be removed with pumps or other conventional de-watering equipment.

8.2 Pond - Side Slopes

According to the referenced plan, the side slopes for the pond from Elev. 595 to 583 are planned at 5 (horizontal) to 1 (vertical) and slope from Elev. 607 to 596 are planned at 3 (horizontal) to 1 (vertical). However, the residual clay and shaly clay soils of the Eagle Ford Formation in Frisco are known to be inherently unstable at slopes steeper than 4 horizontal to 1 vertical (4H:1V). Therefore, all slopes associated with the pond should be designed to be not steeper than 4H:1V.

Slope stability analyses were performed for the proposed pond at Section 2 as shown on the Boring Location Plan, Figure 1, using a slope not steeper than 4H:1V. A minimum acceptable factor of safety against slope failure of 1.3 for sudden drawdown and 1.5 for long-term condition is customarily acceptable for similar earthen slopes. Stability analyses are generally described in Section 6.5.3 above.

Results of our stability analyses as shown on Figures 6a and 6b in the Appendix indicate pond slopes constructed not steeper than 4H:1V are judged to be stable.

9.0 GENERAL CONSTRUCTION PROCEDURES AND RECOMMENDATIONS

Variations in subsurface conditions could be encountered during construction. To permit correlation between test boring data and actual subsurface conditions encountered during construction, it is recommended a registered Professional Engineering firm be retained to observe construction procedures and materials.

Some construction problems, particularly degree or magnitude, cannot be reasonably anticipated until the course of construction. The recommendations offered in the following paragraphs are intended not to limit or preclude other conceivable solutions, but rather to provide our observations based on our experience and understanding of the project characteristics and subsurface conditions encountered in the borings.

9.1 Site Preparation and Grading

All areas supporting the floor slab, pavement, flatwork, and areas to receive new fill should be properly prepared.

After completion of the necessary stripping, clearing, and excavating and prior to placing any required fill, the exposed soil subgrade should be carefully evaluated by probing and testing. Any undesirable material (organic material, wet, soft, or loose soil) still in place should be removed.

The exposed soil subgrade should be further evaluated by proof-rolling with a heavy pneumatic tired roller, loaded dump truck or similar equipment weighing approximately 10 tons to check for pockets of soft or loose material hidden beneath a thin crust of possibly better soil.

Proof-rolling procedures should be observed routinely by a Professional Engineer or his designated representative.

Any undesirable material (organic material, wet, soft, or loose soil) exposed should be removed and replaced with well-compacted material as outlined in Section 9.3.

Prior to placement of any fill, the exposed soil subgrade should then be scarified to a minimum depth of 6 inches and recompacted as outlined in Section 9.3.

If fill is to be placed on existing slopes (natural or constructed) steeper than six horizontal to one vertical (6:1), the fill materials should be benched into the existing slopes in such a manner as to provide a minimum bench-key width of five (5) ft. This should provide a good contact between the existing soils and new fill materials, reduce potential sliding planes, and allow relatively horizontal lift placements.

All excavations should be braced or cut at stable slopes in accordance with Occupational Safety and Health Administration (OSHA) requirements.

Due to the nature of the clay soils found near the surface at the borings, traffic of heavy equipment (including heavy compaction equipment) may create pumping and general deterioration of shallow soils. Therefore, some construction difficulties should be anticipated during periods when these soils are saturated.

9.2 Foundation Excavations

All foundation excavations should be monitored to verify foundations bear on suitable material. The bearing stratum exposed in the base of all foundation excavations should be protected against any detrimental change in conditions. Surface runoff water should be drained away from excavations and not allowed to collect. All concrete for foundations should be placed as soon as practical after the excavation is made. Underreamed piers should be excavated and concrete placed the same day.

Prolonged exposure of the bearing surface to air or water will result in changes in strength and compressibility of the bearing stratum. Therefore, if delays occur, underream pier excavations and shallow foundations for retaining walls should be slightly deepened and cleaned, in order to provide a fresh bearing surface.

All pier shafts should be at least 1.5-ft in diameter to facilitate clean-out of the base and proper monitoring. Concrete placed in pier holes should be directed through a tremie, hopper, or equivalent. Placement of concrete should be vertical through the center of the shaft without hitting the sides of the pier or reinforcement to reduce the possibility of segregation of aggregates. Concrete placed in piers should have a minimum slump of 5 inches (but not greater than 7 inches) to avoid potential honey-combing.

Observations during pier drilling should include, but not necessarily be limited to, the following items:

Verification of proper bearing strata and consistency of subsurface stratification with regard to boring logs,

Confirmation the minimum required penetration into the bearing strata is achieved,

Complete removal of cuttings from bottom of pier holes,

Proper handling of any observed water seepage and sloughing of subsurface materials,

No more than 2 inches of standing water should be permitted in the bottom of pier holes prior to placing concrete, and

Verification of pier diameter, underream size and steel reinforcement.

Groundwater seepage was not encountered in the borings. However, it is common to detect seasonal groundwater particularly during or after periods of precipitation. The clays at the foundation bearing level could be prone to collapse during construction of the underreams. Immediate placement of concrete after constructing the underream and/or the use of submersible pumps may be adequate to control seepage. Some field adjustments in the depth of the piers may be required in some areas to maintain the bottom of the piers above any groundwater seepage. Adjustments in the depths of the piers should be observed in the field by ALPHA personnel. Immediate placement of concrete may be useful if underream collapse occurs.

Temporary casing may be useful in controlling water seepage occurring from fractures in the native clay soils. As casing is extracted, care should be taken to maintain a positive head of plastic concrete and minimize the potential for intrusion of water seepage. It is recommended a separate bid item be provided for casing on the contractors' bid schedule.

9.3 Fill Compaction

Materials used as select, non-expansive material should have a liquid limit less than 35, a plasticity index (PI) not less than about 4 nor greater than 15 and contain no more than 0.5 percent fibrous organic materials, by weight. All select material should contain no deleterious material and should be compacted to a dry density of at least 95 percent standard Proctor maximum dry density (ASTM D 698) and within the range of 1 percentage point below to 3 percentage points above the material's optimum moisture content. (Note: The plasticity index and liquid limit of material used as select non-expansive material should be routinely verified during placement using laboratory tests. Visual observation and classification should not be relied upon to confirm the material to be used as select, non-expansive material satisfies the above Atterberg-limit criteria).

The fill compaction recommendations provided below are applicable for general site grading outside the planned building pad area. Fill placed within the building area should consist of moisture-conditioned materials and select fill as discussed in Section 6.2 of this report.

Clay soils with a plasticity index equal to or greater than 25 should be compacted to a dry density between 93 and 98 percent of standard Proctor maximum dry density (ASTM D 698). The compacted moisture content of the clays during placement should be within the range of 2 to 6 percentage points above optimum.

Clayey materials used as fill should be processed and the largest particle or clod should be less than 6 inches prior to compaction.

In cases where either mass fills or utility lines are more than 10 ft deep, the fill/backfill below 10 ft should be compacted to at least 100 percent of standard Proctor maximum dry density (ASTM D-698) and within 2 percentage points of the material's optimum moisture content. The portion of the fill/backfill shallower than 10 ft should be compacted as outlined above.

Compaction should be accomplished by placing fill in about 8-inch thick loose lifts and compacting each lift to at least the specified minimum dry density. Field density and moisture content tests should be performed on each lift. As a guide, one test per 2,500 sq ft per lift is recommended in the building area. Utility trench backfill should be tested at a rate of one test per lift per each 300 lineal feet of trench.

9.4 Groundwater

Groundwater was not encountered in the borings. However, from our experience, groundwater could be encountered during general excavation at this site. The risk of encountering this seepage is increased during or after periods of precipitation. Standard sump pit and pumping procedures should be adequate to control seepage on a local basis for relatively shallow excavations.

In any areas where cuts of 1.5 ft or more are made to establish final grades, attention should be given to possible seasonal water seepage that could occur through natural cracks and fissures in the newly exposed stratigraphy. In this case, subsurface drains may be required to intercept seasonal groundwater seepage. The need for these or other de-watering devices should be carefully addressed during construction. Our office could be contacted to visually observe the final grades to evaluate the need for such drains.

10.0 LIMITATIONS

Professional services provided in this geotechnical exploration were performed, findings obtained, and recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. The scope of services provided herein does not include an environmental assessment of the site or investigation for the presence or absence of hazardous materials in the soil, surface water or groundwater.

ALPHA TESTING, INC. is not responsible for conclusions, opinions or recommendations made by others based on this data. Information contained in this report is intended for exclusive use of the Client (and their design representatives) and design of the specific structure outlined in Section 2.0. Recommendations presented in this report should not be used for design of any other structure except that specifically described in this report. Further, subsurface conditions can change with passage of time. Recommendations contained herein are not considered applicable for an extended period of time after the completion date of this report. It is recommended our office be contacted for a review of the contents of this report for construction commencing more than one (1) year after completion of this report.

Recommendations provided in this report are based on our understanding of information provided by the Client about characteristics of the project. If the Client notes any deviation from the facts about project characteristics, our office should be contacted immediately since this may materially alter the recommendations. Further, ALPHA TESTING, INC. is not responsible for damages resulting from workmanship of designers or contractors and it is recommended the Owner retain qualified personnel, such as a Geotechnical Engineering Firm, to verify construction is performed in accordance with plans and specifications.

APPENDIX

SOIL MODIFICATION
WATER PRESSURE INJECTION (WPI)
GUIDELINE SPECIFICATIONS

Purpose

The purpose of this specification is to provide a procedural basis for using water pressure injection as a method to obtain a relatively uniform, moist, pre-swelled zone of soil beneath the floor slab. Specifically, the intent of this procedure is to reduce the average free swell potential of soils within the injected zone to 1 percent or less.

Material

1. Only potable water shall be used during the entire injection process.

2. A non-ionic surfactant (wetting agent) will be added to the water according to manufacturer's recommendations, but, in no case will proportions be less than one part (undiluted) per 3,500 gallons of water.

Application

1. The water pressure injection work shall be accomplished after the site has been brought to near final subgrade elevation and prior to installation of any plumbing, trenches and utilities.

2. The injection vehicle will have a minimum gross weight of 5 tons and shall be capable of making straight vertical penetrations to minimize pressure loss around the injector rods to at least 12 ft.

3. Injections will be continued to "REFUSAL" (until the maximum reasonable quantity of water has been injected into the soil and water is flowing freely at the surface, either out of previous injection holes or from areas where the surface soils have fractured. The amount of water flowing from the areas described above will be approximately equivalent to the volume of water being pumped into the soil. As a minimum, injections should be at least 30 seconds at each injection interval unless altered by the Geotechnical Engineer).

   Note: Loss of water or blow-back around injector pipes does not constitute refusal. Continued loss of water in this manner may indicate inadequate injection equipment or techniques, or in some instances, surficial soils that will not form an adequate seal to contain the water. In either instance, the owner's representative should be contacted and an on-site observation made to determine appropriate steps to achieve adequate injection.

   After completion of water injection, the injection contractor will submit records which reflect the total quantity of water used. The injection contractor will be totally responsible for determining the means and methods of injecting the on-site soils such that the average free swell of soils within the injected zone does not exceed 1 percent.

4. Injection pipe(s) will penetrate the soil in approximately 12 to 18-inch intervals, injecting to refusal at each interval for a total depth of 12 ft or impenetrable material, whichever occurs first. If a seemingly impenetrable layer is encountered, ALPHA TESTING, INC. must be contacted to evaluate the significance of the lack of penetration with the injector tubes or provide alternate recommendations. A minimum of eight (8) injection intervals will be provided for the 12-ft injection depth. The lower portion of the injection pipe will consist of a hole pattern that will uniformly disperse water throughout the entire depth.

5. Spacing for the injections will not exceed 5 feet on-center each way. Subsequent injections will be offset laterally at one-half the distance in both directions between the original injection centers.

6. Injection pressures should be adjusted to inject the greatest quantity of water possible within a pressure range of 50 - 200 psi pump pressure.

7. After a minimum curing time of 48 hours, the water injected pad shall be tested for moisture content and swell abatement to determine if additional injections with water are necessary. Subsequent water injections will be 5 feet on-center each way and spaced 2 1/2 feet offset in two orthogonal directions from the initial injection.

8. Upon completion of the final water pressure injection, the top surface of the injected pad should be scarified to a depth of at least 6 inches and re-compacted to between 93 and 98 percent of the optimum density, at a moisture content between 2 and 4 percentage points above the optimum values, as defined by ASTM D-698. Compaction tests should be performed at a frequency of one (1) test per 5,000 sq ft with a minimum of three (3) tests per pad.

9. The moisture content of the injected soils will be maintained until the floor slab is placed. Loss of moisture from the surface or sides of the building pad must be prevented by watering or use of a membrane. Any open trenches should be sealed or kept wet to prevent loss of moisture. All trenches should be backfilled with the excavated material. The moisture content of the backfill should be maintained in the range of 2 to 4 percentage points above optimum.

Special Considerations

Several water injections may be required to achieve the desired final moisture content and corresponding soil swell abatement. Due to variations in the subsurface soils, the number of injection passes required to reduce the swell potential of the injected soils to 1 percent or less is unknown. Hence, the Client should allow for extra construction time on the site considering the time frame required to achieve the desired reduction in swell potential is unknown. Further, the contract with the Injection Contractor should address the situation where more injection passes than predicted are required to achieve the desired result.

Between the time the subgrade is water pressure injected and either the select fill material or plastic sheeting is placed, the upper surface of the injected soil should not be allowed to dry. To allow for adequate pre-swelling of the soils from the injection procedure, concrete for slabs should not be placed above injected areas until at least two (2) weeks following the final water injection. During this 2-week period, the surface of the injected soil must be kept moist or covered with plastic sheeting to prevent moisture loss. About 4 to 5 inches of heave can be expected in building pads during and shortly after completion of the injection process.

Additionally, experience indicates injection adjacent to existing structures supported at or near the existing ground surface (such as, but not limited to, buildings, roads, and utility conduits) can result in swelling of soil in the injected zone as well as those beneath existing nearby structures. Swelling of soil supporting existing floor slabs can result in distress (movement) to existing buildings. Therefore, if an existing building or other structure is located within 30 ft of the proposed water injection area, it is recommended a temporary vertical moisture barrier be installed longitudinally between the existing structure and the injected pad to prevent injected water from entering the subgrade of the existing structure. The moisture barrier could consist of a 10-ft deep trench (about 1 ft wide) backfilled with lean concrete or other suitable relatively impermeable material.

Monitoring

A full-time ALPHA TESTING, INC. technician should be retained and present throughout the injection operations. Moisture content and free swell samples should be taken at 1-foot intervals to the total depth injected from a minimum of one test boring per each 4,000 sq feet of injected area (minimum two borings per pad). The moisture content and shear strength (using a pocket-penetrometer) will be determined for each sample. One-dimension free swell tests (ASTM D 4546-85 Method B) will be performed on selected samples at a frequency of at least four (4) free swell tests per test boring. The free swell tests will be performed with a surcharge equal to the overburden pressure anticipated upon completion of the new structure. Based upon the test results, the current swell potential of the injected soils should be determined by the project Geotechnical Engineer. Acceptance criteria for water pressure injection will be based upon achieving the potential movements indicated in the Geotechnical Exploration. As a guide, an average free swell of 1 percent or less in the injected zone could be used for planning. However, due to variations in the soils across the site, an average free swell of more than 1 percent may be allowable in some areas. Acceptance of soils with average free swells of more than 1 percent should be evaluated by ALPHA TESTING, INC. Depending upon the moisture content and the potential swell remaining in the existing injected soils, additional injections with water containing surfactant may be required until these requirements are met.

Wet and soft surface conditions resulting from the water injection procedures will require the contractor to provide access to drilling equipment used to obtain the soil samples which verify the injection process. Special track equipment may be required to provide the required access. The contractor will be responsible for providing and operating suitable equipment to permit sampling of the injected soils (test borings) with a standard truck-mounted drilling rig.

A-1 METHODS OF FIELD EXPLORATION

Using standard rotary drilling equipment, a total of nine (9) test borings were performed for this geotechnical exploration at the approximate locations shown on the Boring Location Plan, Figure 1. The test boring locations were staked by the Client's representative.

Relatively undisturbed samples of the cohesive subsurface materials were obtained by hydraulically pressing 3-inch O.D. thin-wall sampling tubes into the underlying soils at selected depths (ASTM D 1587). These samples were removed from the sampling tubes in the field and examined visually. One representative portion of each sample was sealed in a plastic bag for use in future visual examinations and possible testing in the laboratory.

A modified version of the Texas Cone Penetration (TCP) test was used to assess the apparent in-place strength characteristics of the rock type materials. A 3-inch diameter steel cone driven by a 170-pound hammer dropped 24 inches (340 ft-pounds of energy) is the basis for TxDOT strength correlations. In this case, ALPHA TESTING, INC. has modified the procedure by using a 140-pound hammer dropping 30-inches (350 ft-pounds of energy) for completion of the field test. Depending on the resistance (strength) of the materials, either the number of blows of the hammer required to provide 12 inches of penetration, or the inches of penetration of the cone due to 100 blows of the hammer are recorded on the field logs and are shown on the Log of Boring sheets as "TX Cone" (reference: TxDOT Test Method TEX 132-E).

Logs of the borings are included in the Appendix of this report. The logs show a visual description of subsurface strata encountered using the Unified Soil Classification System. Sampling information, pertinent field data, and field observations are also included. The subsurface samples will be retained in the laboratory for at least 30 days and then discarded unless the Client requests otherwise.

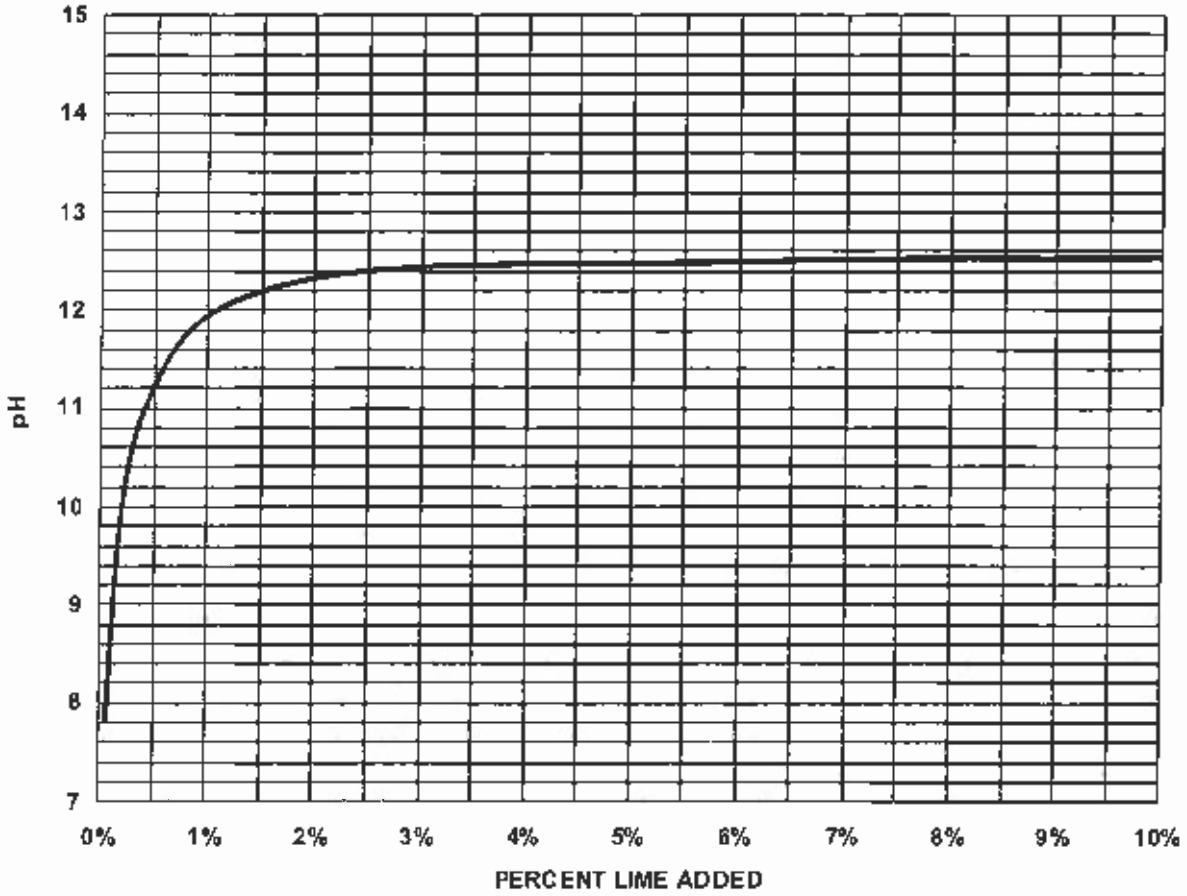
B-1 METHODS OF LABORATORY TESTING

Representative samples were examined and classified by a qualified member of the Geotechnical Division and the boring logs were edited as necessary. To aid in classifying the subsurface materials and to determine the general engineering characteristics, natural moisture content tests (ASTM D 2216), Atterberg-limit tests (ASTM D 4318) and dry unit weight determinations were performed on selected samples. In addition unconfined compression tests (ASTM D 2166) and pocket-penetrometer tests were conducted on selected soil samples to evaluate the soil shear strength. Results of all laboratory tests described above are provided on either the accompanying Log of Boring sheets or on summary data sheets as noted.

In addition to the Atterberg-limit tests, the expansive properties of the clay soils were further analyzed by absorption swell tests. The swell test is performed by placing a selected sample in a consolidation machine and applying either the approximate current or expected overburden pressure and then allowing the sample to absorb water. When the sample exhibits very little tendency for further expansion, the height increase is recorded and the percent free swell and total moisture gain calculated. Results of the absorption swell test are provided on the Swell Test Data sheet, Figure 2 included in this appendix.

Lime series tests (Eades-Grimm Method) were performed on brown clay to aid in assessment of the amount of lime required, and the results are presented on Figure 3. In addition, results of a standard Proctor test (ASTM D 698) performed on lime stabilized material (Figure 4) are included. The standard Proctor tests was performed using 9.5 percent lime to determine the maximum dry unit weight and optimum moisture content of the lime stabilized brown clay.

pH LIME SERIES



SOIL SAMPLE DATA

DESCRIPTION: Brown Clay

LOCATION : Boring #5

LIQUID LIMIT : PLASTICITY INDEX

pH LIME SERIES DATA

PERCENT LIME	0	1	2	6	8	10
pH	7.69	11.97	12.37	12.43	12.46	12.52

CLIENT: Huitt-Zollars, Inc. Frisco, TX	TBPE Firm No. 813	**LABORATORY TEST:** LIME SERIES DATA FIGURE - 3
PROJECT NAME: Vista Park Frisco, Texas	**ALPHA PROJECT NO.:** G110075	**DATE:** 02/15/11

ALPHA TESTING

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TBPE Firm No. 813

OUR REPORT NO.: G110075 DATE: 02/17/11

MATERIAL DESCRIPTION: BROWN CLAY

CLASSIFICATION: LIME TREATED (9.5%)
SAMPLE LOCATION: BORING 5

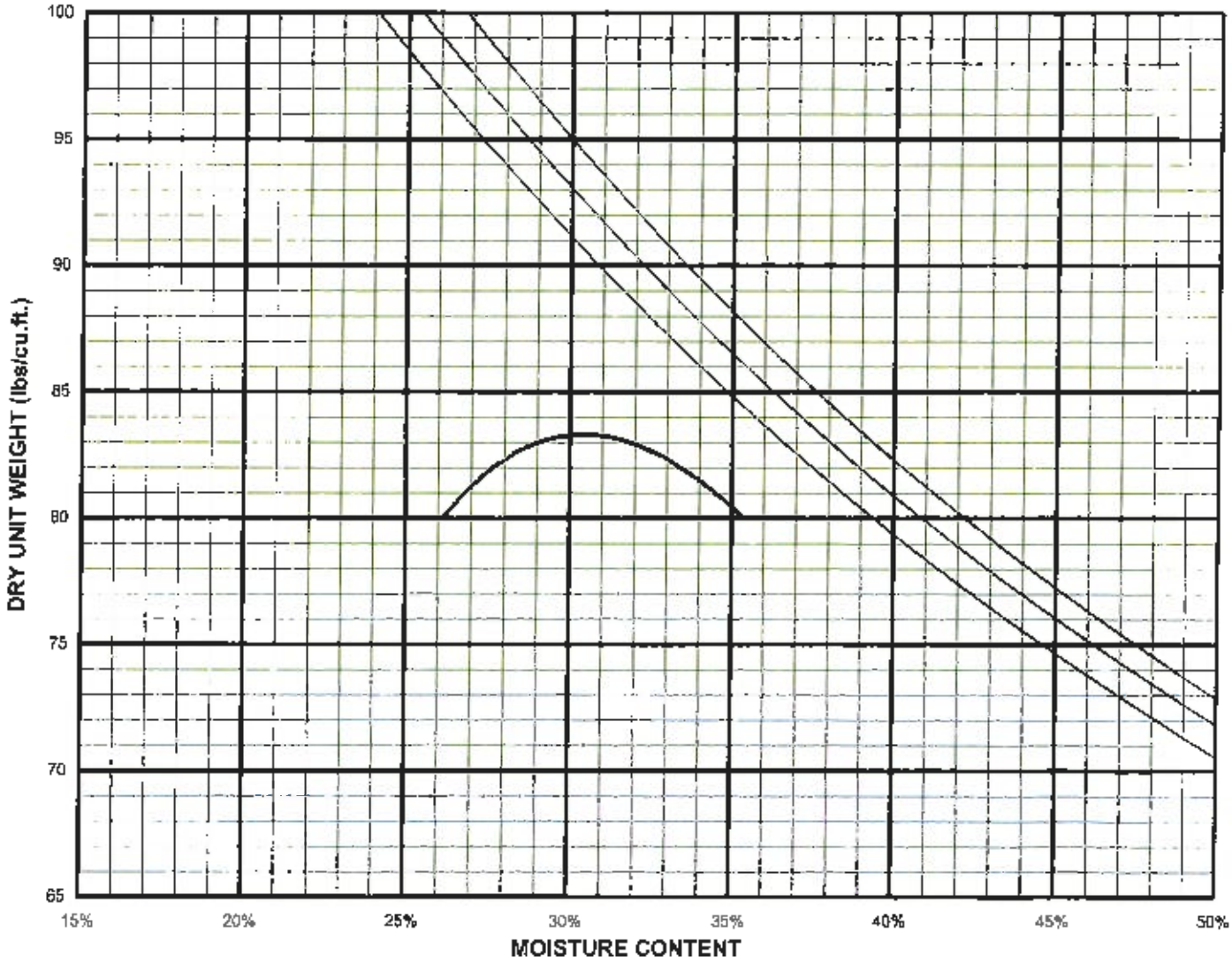
TESTED FOR: Huitt-Zollars, Inc.
Frisco, Texas

PROJECT: Vista Park
Frisco, Texas

TEST METHOD:	ASTM D698-A	
SOIL ID NUMBER:	1L	
MAXIMUM DRY UNIT WEIGHT:	83.2	PCF
OPTIMUM MOISTURE CONTENT:	30.2	%
LIQUID LIMIT:	58	
PLASTIC LIMIT:	46	
PLASTICITY INDEX:	12	
% FINER THAN NO. 200 SIEVE:		

Figure 4

MOISTURE DENSITY RELATIONSHIP

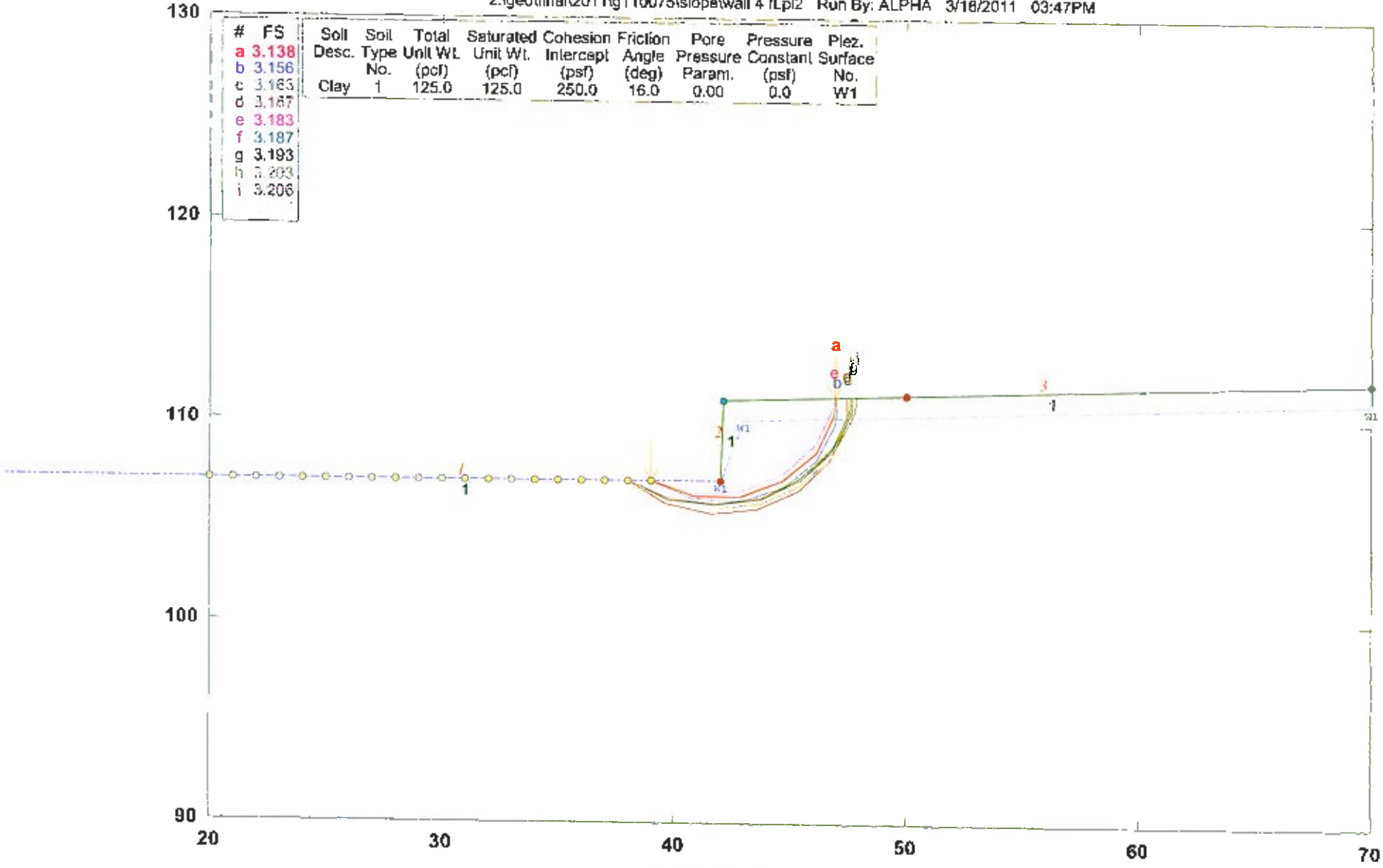


Respectfully Submitted,

ALPHA TESTING, INC.

Vista Park Retaining Wall - Section 1 Figure 5

z:\geo\final\2011\g110075\slope\wall 4 fLpl2 Run By: ALPHA 3/18/2011 03:47PM



GSTABL7 v.2 FSmin=3.138

Safety Factors Are Calculated By The Modified Bishop Method

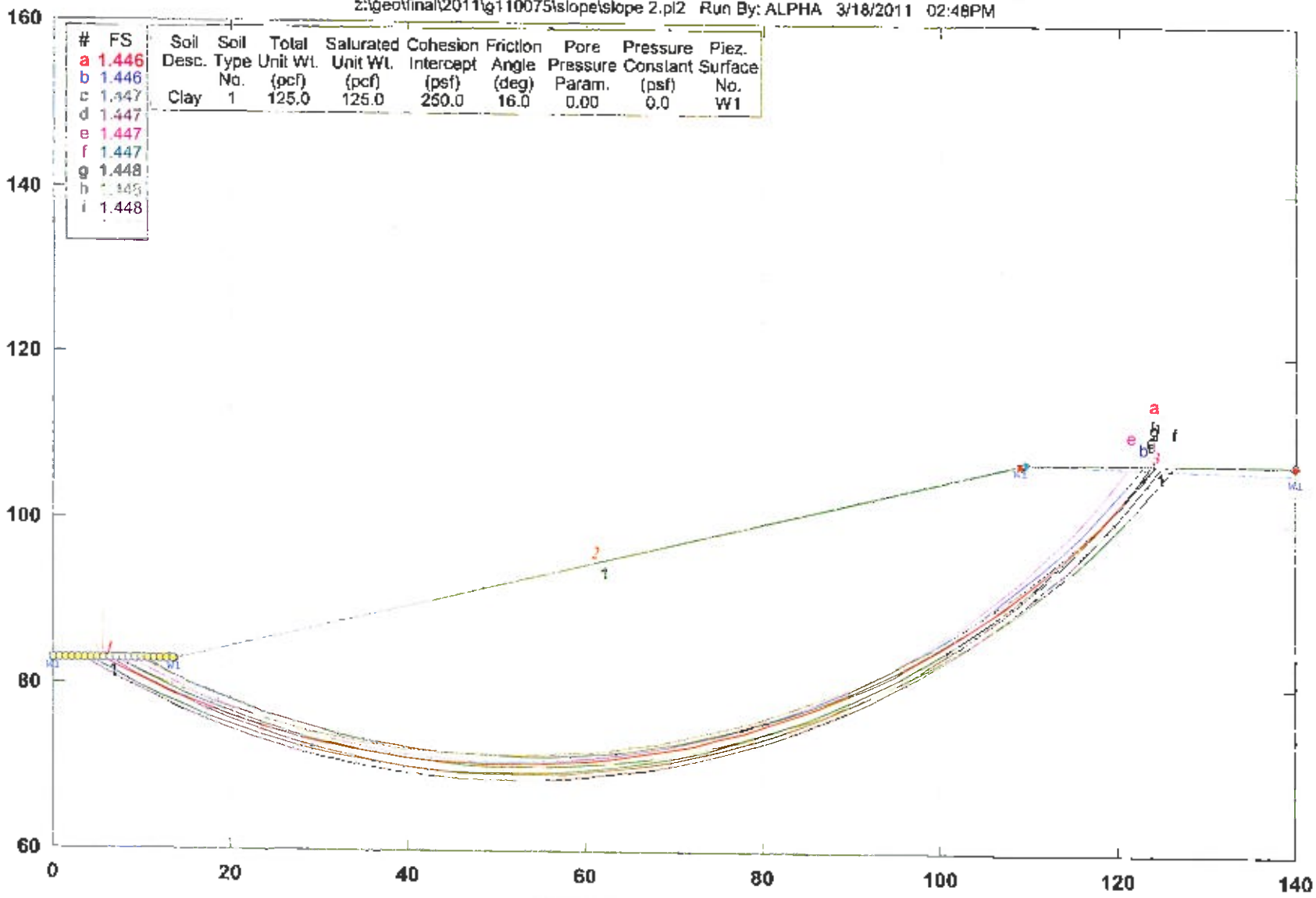
GSTABL7

Vista Park - Pond Slope-Section 2 (Sudden Drawdown)Fig. 6a

z:\geo\final\2011\g110075\slope\slope 2.pl2 Run By: ALPHA 3/18/2011 02:48PM

#	FS
a	1.446
b	1.446
c	1.447
d	1.447
e	1.447
f	1.447
g	1.448
h	1.448
i	1.448

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Salurated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
Clay	1	125.0	125.0	250.0	16.0	0.00	0.0	W1



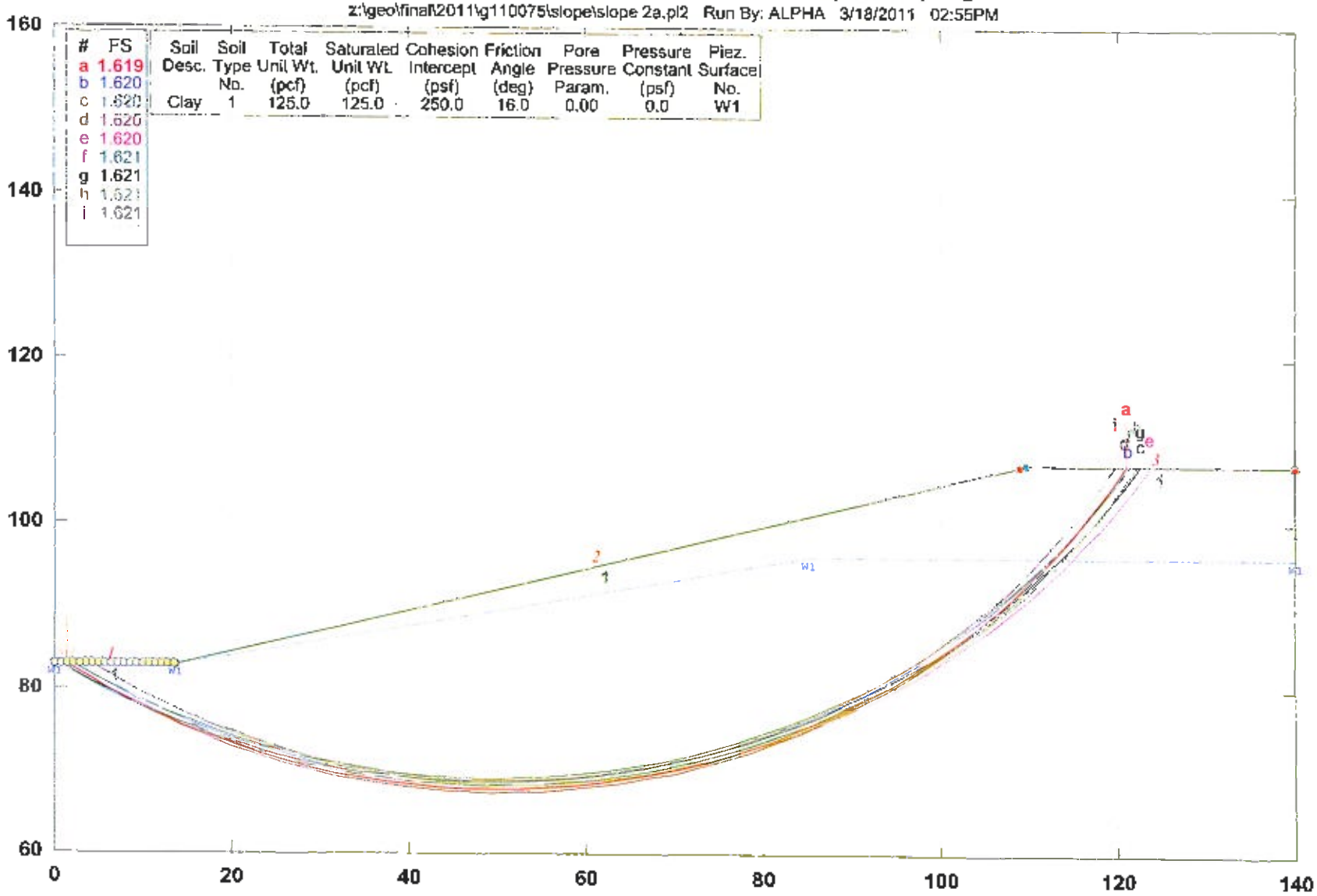
GSTABL7 v.2 FSmin=1.446

Safety Factors Are Calculated By The Modified Bishop Method

GSTABL7

Vista Park - Pond Slope-Section 2 (Long Term) Fig. 6b

z:\geo\final\2011\g110075\slope\slope 2a.pl2 Run By: ALPHA 3/18/2011 02:55PM



GSTABL7 v.2 FSmin=1.619

Safety Factors Are Calculated By The Modified Bishop Method

GSTABL7

ALPHA TESTING
WHERE IT ALL BEGINS

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LOG OF BORING NO.: 1

Sheet 1 of 1

PROJECT NO.: G110075

Client: HUITT-ZOLLARS, INC.
Project: VISTA PARK AT PHILLIPS CREEK RANCH
Start Date: 2/14/2011 **End Date:** 2/14/2011
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: FRISCO, TEXAS
Surface Elevation:
West:
North:
Hammer Drop (lbs / in): 140 / 30

GROUND WATER OBSERVATIONS
On Rods (ft): NONE
After Drilling (ft): DRY
After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
0		Brown CLAY				1.5							
		-with silt seams below 2'				4.5+				28			
5						4.5+				32			
		Tan and Gray SHALY CLAY with clay shale seams (6.0)				4.5+							
10						4.5+				32	75	28	47
		(12.0)											
		Dark Gray CLAY SHALE				4.5+				24			
15													
20		(20.0)			100/ 8.25"								
		Dark Gray SHALE											
25		(25.0)			100/ 4.5"								
		TEST BORING TERMINATED AT 25 FT											
30													

ALPHA TESTING
WHERE IT ALL BEGINS

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LOG OF BORING NO.: 2

PROJECT NO.: G110075

Client: HUITT-ZOLLARS, INC.
Project: VISTA PARK AT PHILLIPS CREEK RANCH
Start Date: 2/14/2011 End Date: 2/14/2011
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: FRISCO, TEXAS
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
▽ On Rods (ft): NONE
▼ After Drilling (ft): DRY
▽ After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Dark Brown CLAY				2.0							
						4.0				30	77	28	49
5		-brown below 4' with silty sand seams				3.0				30			
						4.0				32			
		8.0											
10		Gray and Tan SHALY CLAY				4.5							
15						4.5+				31			
		16.0											
20		Dark Gray CLAY SHALE			100/ 11"								
25		25.0			100/ 5.75"								
		TEST BORING TERMINATED AT 25 FT											
30													

ALPHA TESTING
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LOG OF BORING NO.: 3

PROJECT NO.: G110075

Client: HUITT-ZOLLARS, INC.
Project: VISTA PARK AT PHILLIPS CREEK RANCH
Start Date: 2/14/2011 End Date: 2/14/2011
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: FRISCO, TEXAS
Surface Elevation:
West:
North:
Hammer Drop (lbs / in): 140 / 30

GROUND WATER OBSERVATIONS
On Rods (ft): NONE
After Drilling (ft): DRY
After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
0		Dark Brown CLAY with small calcareous nodules				1.75							
		-brown below 2'				2.0				37			
5		-reddish brown seams below 4'				3.5				32			
		Tan and Gray SHALY CLAY with reddish brown clay seams				4.5							
10						4.5				29			
		-shale seams below 13'				4.5+							
15													
20						4.5+							
		Gray CLAY SHALE			100/8"								
25		TEST BORING TERMINATED AT 25 FT											
30													

ALPHA TESTING
WHERE IT ALL BEGINS

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LOG OF BORING NO.: 4

PROJECT NO.: G110075

Client: HUITT-ZOLLARS, INC.
Project: VISTA PARK AT PHILLIPS CREEK RANCH
Start Date: 2/15/2011 **End Date:** 2/15/2011
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: FRISCO, TEXAS
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
▽ On Rods (ft): NONE
▼ After Drilling (ft): DRY
▼ After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown CLAY				2.5							
		2.0											
		Tannish Brown and Gray CLAY				4.5+				30	88	33	55
		4.0											
5		Tan and Gray SHALY CLAY with silt seams				4.5+				24			
		-blocky structure below 6'				4.5+				26			
		-clay shale seams below 8'				4.5+				26			
10						4.5+				29			
		12.0											
		TEST BORING TERMINATED AT 12 FT											
15													
20													
25													
30													

ALPHA TESTING
WHERE IT ALL BEGINS

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LOG OF BORING NO.: 5

Sheet 1 of 1

PROJECT NO.: G110075

Client: HUITT-ZOLLARS, INC.
Project: VISTA PARK AT PHILLIPS CREEK RANCH
Start Date: 2/15/2011 **End Date:** 2/15/2011
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: FRISCO, TEXAS
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
On Rods (ft): NONE
After Drilling (ft): DRY
After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown CLAY with some sand				1.0							
		2.0											
		Tan and Gray SHALY CLAY				2.5				33			
5						4.5				31	65	31	54
						4.5+				32			
		8.0											
		Gray and Tan SHALY CLAY with silt seams				4.5+				30	71	25	46
10		-clay shale seams below 10'				4.5+							
		12.0											
		TEST BORING TERMINATED AT 12 FT											
15													
20													
25													
30													

ALPHA TESTING
WHERE IT ALL BEGINS

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LOG OF BORING NO.: 6

Sheet 1 of 1

PROJECT NO.: G110075

Client: HUITT-ZOLLARS, INC.
Project: VISTA PARK AT PHILLIPS CREEK RANCH
Start Date: 2/15/2011 End Date: 2/15/2011
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: FRISCO, TEXAS
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
▽ On Rods (ft): NONE
▼ After Drilling (ft): DRY
▽ After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft/in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown CLAY with calcareous nodules				1.25				39			
		2.0											
		Tan and Gray CLAY				4.25				28	84	31	53
5		5.0											
		Tan and Gray SHALY CLAY with silt seams				3.0				27			
						4.5				26			
		8.0											
		Gray and Tan SHALY CLAY				4.5+				29			
10		-clay shale seams below 6'				4.5+							
		12.0											
		TEST BORING TERMINATED AT 12 FT											
15													
20													
25													
30													

ALPHA TESTING
WHERE IT ALL BEGINS

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LOG OF BORING NO.: 7

Sheet 1 of 1

PROJECT NO.: G110075

Client: HUITT-ZOLLARS, INC.
Project: VISTA PARK AT PHILLIPS CREEK RANCH
Start Date: 2/14/2011 **End Date:** 2/14/2011
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: FRISCO, TEXAS
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
▽ On Rods (ft): NONE
▼ After Drilling (ft): DRY
▼ After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft.in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown and Tan CLAY				2.5							
						3.25				27			
5		-tannish brown below 4'				3.0				25	72	26	46
			6.0										
		Gray and Tan SHALY CLAY				2.0				25			
						2.5				28			
10		-blocky structure											
						4.5+				30	87	33	54
15													
						4.5+				30			
20													
		-clay shale seams below 23'				4.5+							
25			25.0										
		TEST BORING TERMINATED AT 25 FT											
30													

ALPHA TESTING
WHERE IT ALL BEGINS

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LOG OF BORING NO.: 8

Sheet 1 of 1

PROJECT NO.: G110075

Client: HUITT-ZOLLARS, INC.
Project: VISTA PARK AT PHILLIPS CREEK RANCH
Start Date: 2/14/2011 **End Date:** 2/14/2011
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: FRISCO, TEXAS
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
▽ On Rods (ft): NONE
▼ After Drilling (ft): DRY
▼ After ___ Hours (ft):

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft,in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown and Tan CALCAREOUS CLAY-FILL -3" asphelt at surface											
		1.0											
		Tan and Gray CLAY				3.5							
						4.5+				23			
		4.0											
5		Tan and Gray SHALY CLAY				1.5				22			
						1.25				22	73	26	47
						3.0				23			
10		-blocky structure											
		12.0											
		Gray and Tan SHALY CLAY				4.5+				30			
15													
						4.5+				28			
20													
		22.0											
		Gray CLAY SHALE with clay zones				4.5+							
25		25.0											
		TEST BORING TERMINATED AT 25 FT											
30													

ALPHA TESTING
WHERE IT ALL BEGINS

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LOG OF BORING NO.: 9

Sheet 1 of 1

PROJECT NO.: G110075

Client: HUITT-ZOLLARS, INC.
Project: VISTA PARK AT PHILLIPS CREEK RANCH
Start Date: 2/15/2011 End Date: 2/15/2011
Drilling Method: CONTINUOUS FLIGHT AUGER

Location: FRISCO, TEXAS
Surface Elevation:
West:
North:
Hammer Drop (lbs / in):

GROUND WATER OBSERVATIONS
On Rods (ft): NONE
After Drilling (ft): DRY
After ___ Hours (ft).

Depth, feet	Graphic Log	MATERIAL DESCRIPTION	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft, in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
		Brown CLAY with calcareous nodules				2.0							
						4.5				27			
		4.0											
5		Gray and Tan SHALY CLAY with clay shale seams				4.5				25			
						4.5				27	73	26	47
						4.5+				30			
10													
		-blocky structure to 13'											
						4.5+				34			
15													
20						4.5+	3.6		87	30			
		23.0											
		Gray CLAY SHALE				4.5+							
25		25.0											
		TEST BORING TERMINATED AT 25 FT											
30													

ALPHA TESTING

WHERE IT ALL BEGINS

KEY TO SOIL SYMBOLS AND CLASSIFICATIONS

SOIL & ROCK SYMBOLS


(CH), High Plasticity CLAY


(CL), Low Plasticity CLAY


(SC), CLAYEY SAND


(SP), Poorly Graded SAND


(SW), Well Graded SAND


(SM), SILTY SAND


(ML), SILT


(MH), Elastic SILT


LIMESTONE


SHALE / MARL


SANDSTONE


(GP), Poorly Graded GRAVEL


(GW), Well Graded GRAVEL


(GC), CLAYEY GRAVEL


(GM), SILTY GRAVEL


(OL), ORGANIC SILT


(OH), ORGANIC CLAY


FILL

SAMPLING SYMBOLS


SHELBY TUBE (3" OD except where noted otherwise)


SPLIT SPOON (2" OD except where noted otherwise)


AUGER SAMPLE


TEXAS CONE PENETRATION


ROCK CORE (2" ID except where noted otherwise)

RELATIVE DENSITY OF COHESIONLESS SOILS (blows/ft)

VERY LOOSE	0 TO 4
LOOSE	5 TO 10
MEDIUM	11 TO 30
DENSE	31 TO 50
VERY DENSE	OVER 50

SHEAR STRENGTH OF COHESIVE SOILS (tsf)

VERY SOFT	LESS THAN 0.25
SOFT	0.25 TO 0.50
FIRM	0.50 TO 1.00
STIFF	1.00 TO 2.00
VERY STIFF	2.00 TO 4.00
HARD	OVER 4.00

RELATIVE DEGREE OF PLASTICITY (PI)

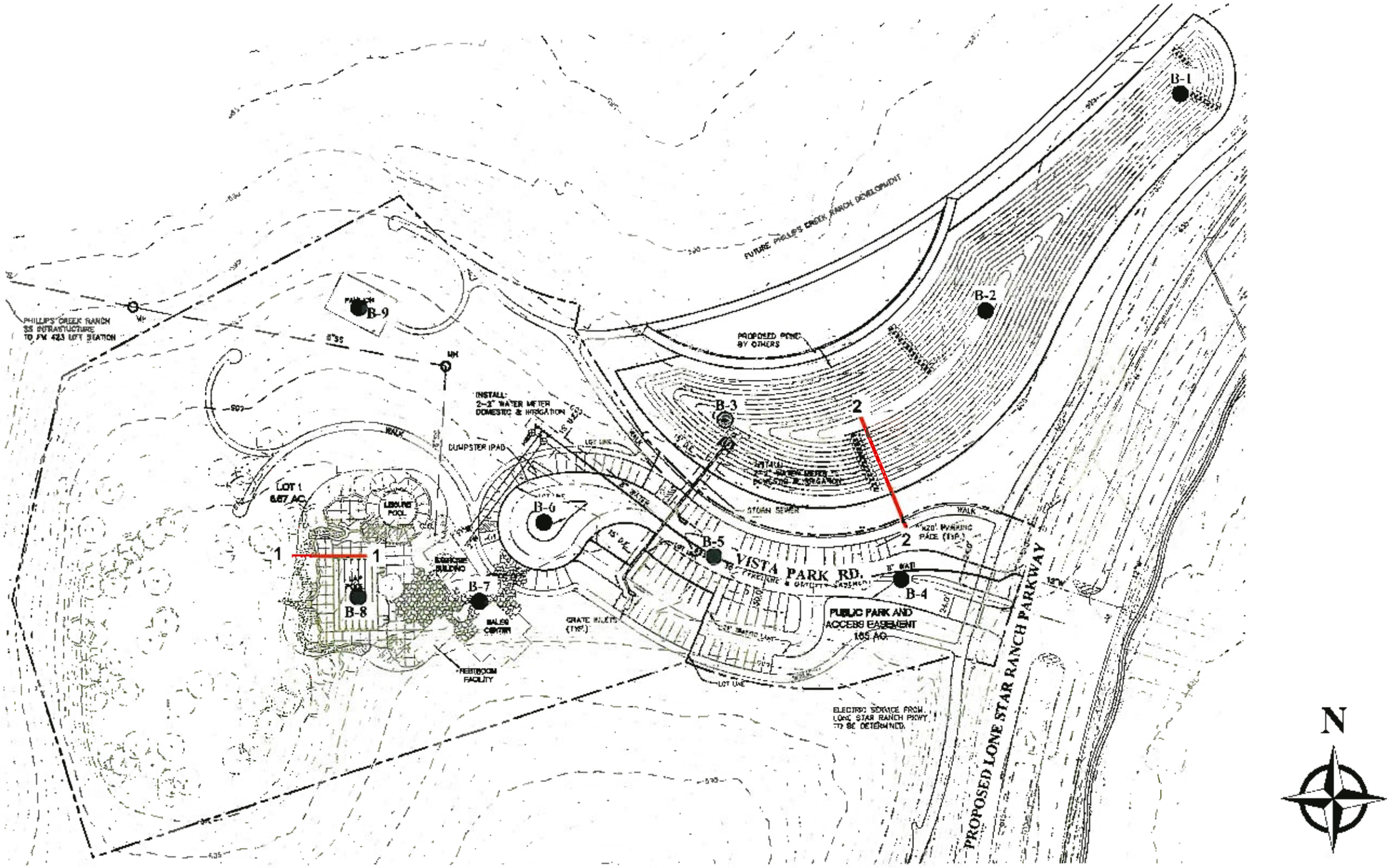
LOW	4 TO 15
MEDIUM	16 TO 25
HIGH	26 TO 35
VERY HIGH	OVER 35

RELATIVE PROPORTIONS (%)

TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	36 TO 50

PARTICLE SIZE IDENTIFICATION (DIAMETER)

BOULDERS	8.0" OR LARGER
COBBLES	3.0" TO 8.0"
COARSE GRAVEL	0.75" TO 3.0"
FINE GRAVEL	5.0 mm TO 3.0"
COURSE SAND	2.0 mm TO 5.0 mm
MEDIUM SAND	0.4 mm TO 5.0 mm
FINE SAND	0.07 mm TO 0.4 mm
SILT	0.002 mm TO 0.07 mm
CLAY	LESS THAN 0.002 mm



SECTIONS FOR STABILITY ANALYSIS

Geotechnical Exploration
Vista Park - Amenity Center, Vista Park Road and Pond
HZ Project No. 013994-13
Off Lone Star Ranch Parkway
Frisco, Texas
Alpha Project No. G110075
March 18, 2011

ALPHA TESTING
WHERE IT ALL BEGINS

Boring Location Plan
Figure 1

The wage rates listed are those predetermined by the Secretary of Labor and State Statue to be the minimum wages paid. To determine the applicable wage rate zone, a list entitled "TEXAS COUNTIES IDENTIFIED BY WAGE RATE ZONES" is provided in the contract. Any wage rate that is not listed must be submitted to the Engineer for approval. IMPORTANT NOTICE FOR STATE PROJECTS; only the controlling wage rate zone applies to the contract. Effective 1-6-2012

CLASS. #	CLASSIFICATION DESCRIPTION	ZONE TX07 1/6/12	ZONE TX08 1/6/12	ZONE TX11 1/6/12	ZONE TX12 1/6/12	ZONE TX14 1/6/12	ZONE TX16 1/6/12	ZONE TX18 1/6/12	ZONE TX34 1/6/12	ZONE TX35 1/6/12	ZONE TX37 1/6/12	ZONE TX38 1/6/12	ZONE TX40 1/6/12	ZONE TX41 1/6/12	ZONE TX54 1/6/12	ZONE TX56 1/6/12	ZONE TX63 1/6/12
1428	Agricultural Tractor Operator						$12.69					$12.35			$11.75		
1300	Asphalt Distributor Operator	$14.87	$13.48	$13.88			$15.55	$15.72	$13.28	$15.32	$15.62	$14.36	$14.25	$14.03	$13.75	$14.06	$14.40
1303	Asphalt Paving Machine Operator	$13.40	$12.25	$12.35	$13.87		$14.36	$14.20	$13.26	$13.99	$14.68	$12.92	$13.44	$12.53	$14.00	$14.32	$12.99
1106	Asphalt Raker	$12.28	$10.61	$12.02	$14.21		$12.12	$11.64	$11.44	$12.69	$12.05	$11.34	$11.67	$11.40	$12.59	$12.36	
1112	Batching Plant Operator, Asphalt																
1115	Batching Plant Operator, Concrete																
1214	Blaster																
1615	Boom Truck Operator						$18.36										
1444	Boring Machine Operator																
1305	Broom or Sweeper Operator	$11.21	$10.33	$10.08			$11.04	$11.62		$11.74	$11.41	$10.30		$10.23	$10.60	$12.68	$11.05
1144	Communications Cable Installer																
1124	Concrete Finisher, Paving and Structures	$13.55	$12.46	$13.16	$12.85		$12.56	$12.77	$12.44	$14.12	$13.04	$13.38		$12.80	$12.79	$12.98	$13.32
1318	Concrete Pavement Finishing Machine Operator						$15.48			$16.05		$19.31				$13.07	
1315	Concrete Paving, Curing, Float, Texturing Machine Operator											$16.34				$11.71	
1333	Concrete Saw Operator									$14.48	$17.33					$13.99	
1399	Concrete/Gunite Pump Operator																
1344	Crane Operator, Hydraulic 80 tons or less						$18.36			$18.12	$18.04	$20.21			$18.63	$13.86	
1345	Crane Operator, Hydraulic Over 80 Tons																
1342	Crane Operator, Lattice Boom 80 Tons or Less	$16.82	$14.39	$13.85			$15.87			$17.27		$14.67			$16.42	$14.97	
1343	Crane Operator, Lattice Boom Over 80 Tons						$19.38			$20.52		$17.49			$25.13	$15.80	
1306	Crawler Tractor Operator	$13.96	$16.63	$13.62			$15.67			$14.07	$13.15	$13.38			$14.60	$13.68	$13.50
1351	Crusher or Screen Plant Operator																
1446	Directional Drilling Locator						$11.67										
1445	Directional Drilling Operator						$17.24										
1139	Electrician	$20.96		$19.87			$26.35		$20.27	$19.80		$20.92				$27.11	
1347	Excavator Operator, 50,000 pounds or less	$13.46	$12.56	$13.67			$12.88	$14.38	$13.49	$17.19		$13.86			$14.09	$12.71	$14.42
1348	Excavator Operator, Over 50,000 pounds		$15.23	$13.52			$17.71			$16.99	$18.80	$16.22				$14.53	
1150	Flagger	$9.30	$9.10	$8.50		$8.81	$9.45	$8.70		$10.06	$9.71	$9.03		$9.08	$9.90	$10.33	$8.10
1151	Form Builder/Setter, Structures	$13.52	$12.30	$13.38	$12.91	$12.71	$12.87	$12.38	$12.26	$13.84	$12.98	$13.07	$13.61	$12.82	$14.73	$12.23	$12.25
1160	Form Setter, Paving & Curb	$12.36	$12.16	$13.93	$11.83	$10.71	$12.94			$13.16	$12.54	$11.33	$10.69		$13.33	$12.34	
1360	Foundation Drill Operator, Crawler Mounted									$17.99						$17.43	
1363	Foundation Drill Operator, Truck Mounted		$16.86	$22.05			$16.93			$21.07	$20.20	$20.76		$17.54	$21.39	$15.89	
1369	Front End Loader Operator, 3 CY or Less	$12.28	$13.49	$13.40			$13.04	$13.15	$13.29	$13.69	$12.64	$12.89			$13.51	$13.32	$12.17
1372	Front End Loader Operator, Over 3 CY	$12.77	$13.69	$12.33			$13.21	$12.86	$13.57	$14.72	$13.75	$12.32			$13.19	$13.17	
1329	Joint Sealer																
1172	Laborer, Common	$10.30	$9.86	$10.08	$10.51	$10.71	$10.50	$10.24	$10.58	$10.72	$10.45	$10.30	$10.25	$10.03	$10.54	$11.02	$10.15
1175	Laborer, Utility	$11.80	$11.53	$12.70	$12.17	$11.81	$12.27	$12.11	$11.33	$12.32	$11.80	$11.53	$11.23	$11.50	$11.95	$11.73	$12.37
1346	Loader/Backhoe Operator	$14.18	$12.77	$12.97	$15.68		$14.12			$15.18	$13.58	$12.87		$13.21	$14.13	$14.29	

CLASS. #	CLASSIFICATION DESCRIPTION	ZONE TX07 1/6/12	ZONE TX08 1/6/12	ZONE TX11 1/6/12	ZONE TX12 1/6/12	ZONE TX14 1/6/12	ZONE TX16 1/6/12	ZONE TX18 1/6/12	ZONE TX34 1/6/12	ZONE TX35 1/6/12	ZONE TX37 1/6/12	ZONE TX38 1/6/12	ZONE TX40 1/6/12	ZONE TX41 1/6/12	ZONE TX54 1/6/12	ZONE TX56 1/6/12	ZONE TX63 1/6/12
1187	Mechanic	$20.14	$15.47	$17.47			$17.10			$17.68	$18.94	$18.58		$16.61	$18.46	$16.96	
1380	Milling Machine Operator	$15.54	$14.64	$12.22			$14.18			$14.32	$14.35	$12.86			$14.75	$13.53	
1390	Motor Grader Operator, Fine Grade	$17.49	$16.52	$16.88			$18.51	$16.69	$16.13	$17.19	$18.35	$17.07	$17.74	$17.47	$17.08	$15.69	$20.01
1393	Motor Grader Operator, Rough	$16.15	$14.62	$15.83		$17.07	$14.63	$18.50		$16.02	$16.44	$15.12		$14.47	$17.39	$14.23	$15.53
1413	Off Road Hauler			$10.08			$11.88			$12.25		$12.23			$13.00	$14.60	
1196	Painter, Structures						$18.34						$21.29			$18.62	
1396	Pavement Marking Machine Operator	$16.42		$13.10			$19.17	$12.01		$13.63	$14.60	$13.17		$16.65	$10.54	$11.18	
1443	Percussion or Rotary Drill Operator																
1202	Piledriver															$14.95	
1205	Pipelayer		$11.87	$14.64			$12.79		$11.37	$13.24	$12.66	$13.24	$11.17	$11.67		$12.12	
1384	Reclaimer/Pulverizer Operator	$12.85					$12.88			$11.01		$10.46					
1500	Reinforcing Steel Worker	$13.50	$14.07	$17.53			$14.00			$16.18	$12.74	$15.83		$17.10		$15.15	
1402	Roller Operator, Asphalt	$10.95		$11.96			$12.78	$11.61		$13.08	$12.36	$11.68			$11.71	$11.95	$11.50
1405	Roller Operator, Other	$10.36		$10.44			$10.50	$11.64		$11.51	$10.59	$10.30		$12.04	$12.85	$11.57	
1411	Scraper Operator	$10.61	$11.07	$10.85			$12.27		$11.12	$12.96	$11.88	$12.43		$11.22	$13.95	$13.47	
1417	Self-Propelled Hammer Operator																
1194	Servicer	$13.98	$12.34	$14.11			$14.51	$15.56	$13.44	$14.58	$14.31	$13.83		$12.43	$13.72	$13.97	
1513	Sign Erector																
1708	Slurry Seal or Micro-Surfacing Machine Operator																
1341	Small Slipform Machine Operator									$15.96							
1515	Spreader Box Operator	$12.60		$13.12			$14.04			$14.73	$13.84	$13.68		$13.45	$11.83	$13.58	
1705	Structural Steel Welder															$12.85	
1509	Structural Steel Worker						$19.29									$14.39	
1339	Subgrade Trimmer																
1143	Telecommunication Technician																
1145	Traffic Signal/Light Pole Worker						$16.00										
1440	Trenching Machine Operator, Heavy						$18.48										
1437	Trenching Machine Operator, Light																
1609	Truck Driver Lowboy-Float	$14.46	$13.63	$13.41	$15.00	$15.93	$15.66			$16.24	$16.39	$14.30	$16.62	$15.63	$14.28	$16.03	
1612	Truck Driver Transit-Mix									$14.14							
1600	Truck Driver, Single Axle	$12.74	$10.82	$10.75			$11.79	$13.53	$13.16	$12.31	$13.40	$10.30	$11.61		$11.97	$11.46	
1606	Truck Driver, Single or Tandem Axle Dump Truck	$11.33	$14.53	$11.95			$11.68		$14.06	$12.62	$11.45	$12.28		$13.08	$11.68	$11.48	$11.10
1607	Truck Driver, Tandem Axle Tractor with Semi Trailer	$12.49	$12.12	$12.50			$12.81	$13.16		$12.86	$16.22	$12.50			$13.80	$12.27	
1441	Tunneling Machine Operator, Heavy																
1442	Tunneling Machine Operator, Light																
1706	Welder		$14.02				$15.97		$13.74	$14.84					$13.78		
1520	Work Zone Barricade Servicer	$10.30	$12.88	$11.46	$11.70		$11.85	$10.77		$11.68	$12.20	$11.22	$11.51	$12.96	$10.54	$11.67	

Notes:

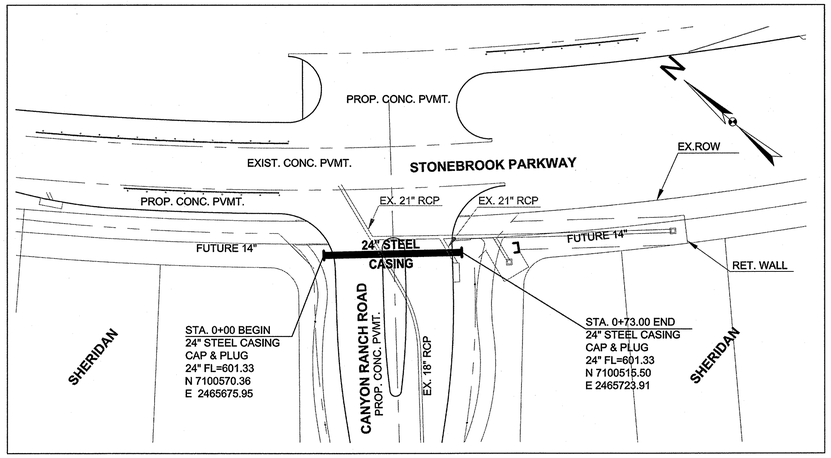
Any worker employed on this project shall be paid at the rate of one and one half (1-1/2) times the regular rate for every hour worked in excess of forty (40) hours per week.

The titles and descriptions for the classifications listed here are further detailed in the AGC of Texas' *Standard Job Classifications and Descriptions for Highway, Heavy, Utilities, and Industrial Construction in Texas*. AGC will make it available on its Web site for any contractor.

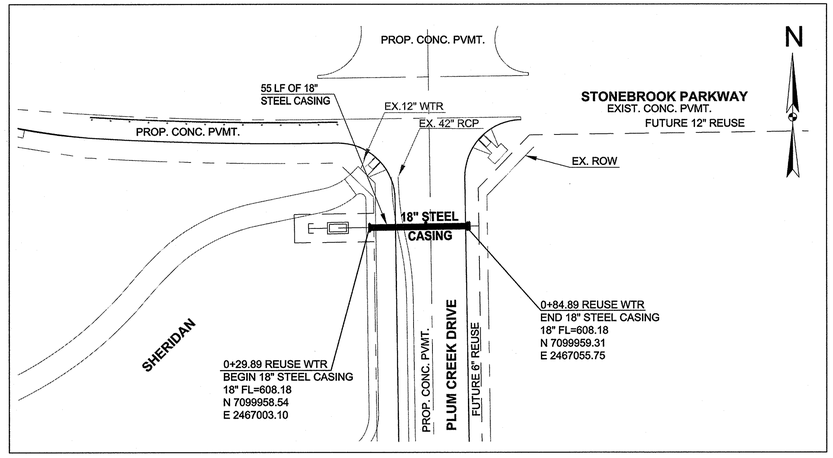
TEXAS COUNTIES IDENTIFIED BY
WAGE RATE ZONES: 7, 8, 11, 12, 14, 16, 18, 34, 35, 37, 38, 40, 41, 54, 56, 63

County Name	Zone	County Name	Zone	County Name	Zone	County Name	Zone
Anderson	38	Donley	54	Karnes	37	Reagan	54
Andrews	54	Duval	41	Kaufman	35	Real	54
Angelina	38	Eastland	54	Kendall	16	Red River	38
Aransas	40	Ector	7	Kenedy	41	Reeves	18
Archer	35	Edwards	18	Kent	54	Refugio	37
Armstrong	7	El Paso	34	Kerr	37	Roberts	54
Atascosa	16	Ellis	35	Kimble	54	Robertson	16
Austin	56	Erath	38	King	54	Rockwall	35
Bailey	54	Falls	38	Kinney	18	Runnels	54
Bandera	16	Fannin	38	Kleberg	37	Rusk	11
Bastrop	16	Fayette	37	Knox	54	Sabine	38
Baylor	54	Fisher	54	Lamar	38	San Augustine	38
Bee	37	Floyd	54	Lamb	54	San Jacinto	56
Bell	16	Foard	54	Lampasas	16	San Patricio	40
Bexar	16	Fort Bend	56	LaSalle	41	San Saba	54
Blanco	37	Franklin	38	Lavaca	37	Schleicher	54
Borden	54	Freestone	38	Lee	37	Scurry	54
Bosque	38	Frio	37	Leon	38	Shackelford	54
Bowie	11	Gaines	54	Liberty	56	Shelby	38
Brazoria	56	Galveston	56	Limestone	38	Sherman	54
Brazos	16	Garza	54	Lipscomb	54	Smith	11
Brewster	18	Gillespie	37	Live Oak	37	Somervell	38
Briscoe	54	Glasscock	54	Llano	37	Starr	41
Brooks	41	Goliad	40	Loving	54	Stephens	54
Brown	54	Gonzales	37	Lubbock	7	Sterling	54
Burleson	16	Gray	54	Lynn	54	Stonewall	54
Burnet	37	Grayson	35	Madison	38	Sutton	18
Caldwell	16	Gregg	11	Marion	38	Swisher	54
Calhoun	40	Grimes	38	Martin	54	Tarrant	35
Callahan	35	Guadalupe	16	Mason	37	Taylor	7
Cameron	8	Hale	54	Matagorda	37	Terrell	18
Camp	38	Hall	54	Maverick	41	Terry	54
Carson	7	Hamilton	38	McCulloch	54	Throckmorton	54
Cass	38	Hansford	54	McLennan	16	Titus	38
Castro	54	Hardeman	54	McMullen	41	Tom Green	7
Chambers	56	Hardin	56	Medina	16	Travis	16
Cherokee	38	Harris	56	Menard	54	Trinity	38
Childress	54	Harrison	63	Midland	7	Tyler	38
Clay	35	Hartley	54	Milam	38	Upshur	11
Cochran	54	Haskell	54	Mills	54	Upton	54
Coke	54	Hays	16	Mitchell	54	Uvalde	41
Coleman	54	Hemphill	54	Montague	54	Val Verde	18
Collin	35	Henderson	38	Montgomery	56	Van Zandt	38
Collingsworth	54	Hidalgo	8	Moore	54	Victoria	14
Colorado	37	Hill	38	Morris	38	Walker	38
Comal	16	Hockley	54	Motley	54	Waller	56
Comanche	54	Hood	38	Nacogdoches	38	Ward	54
Concho	54	Hopkins	38	Navarro	38	Washington	38
Cooke	54	Houston	38	Newton	38	Webb	8
Coryell	16	Howard	54	Nolan	54	Wharton	37
Cottle	54	Hudspeth	18	Nueces	40	Wheeler	54
Crane	54	Hunt	35	Ochiltree	54	Wichita	12
Crockett	18	Hutchinson	54	Oldham	54	Wilbarger	54
Crosby	7	Irion	7	Orange	56	Willacy	41
Culberson	18	Jack	38	Palo Pinto	38	Williamson	16
Dallam	54	Jackson	37	Panola	38	Wilson	16
Dallas	35	Jasper	38	Parker	35	Winkler	54
Dawson	54	Jeff Davis	18	Parmer	54	Wise	35
Deaf Smith	54	Jefferson	56	Pecos	18	Wood	38
Delta	35	Jim Hogg	41	Polk	38	Yoakum	54
Denton	35	Jim Wells	37	Potter	7	Young	54
DeWitt	37	Johnson	35	Presidio	18	Zapata	41
Dickens	54	Jones	35	Rains	38	Zavala	41
Dimmit	41			Randall	7		

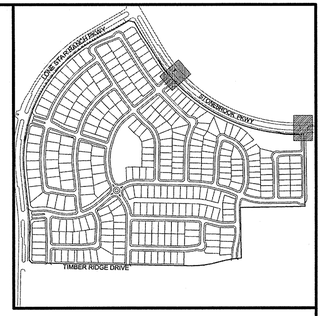
Revised 1-6-12



24" CASING PIPE FOR
FUTURE 14" IRRIGATION REUSE
WATER MAIN



18" CASING PIPE FOR
FUTURE 12" REUSE WATER MAIN



KEY MAP
NTS

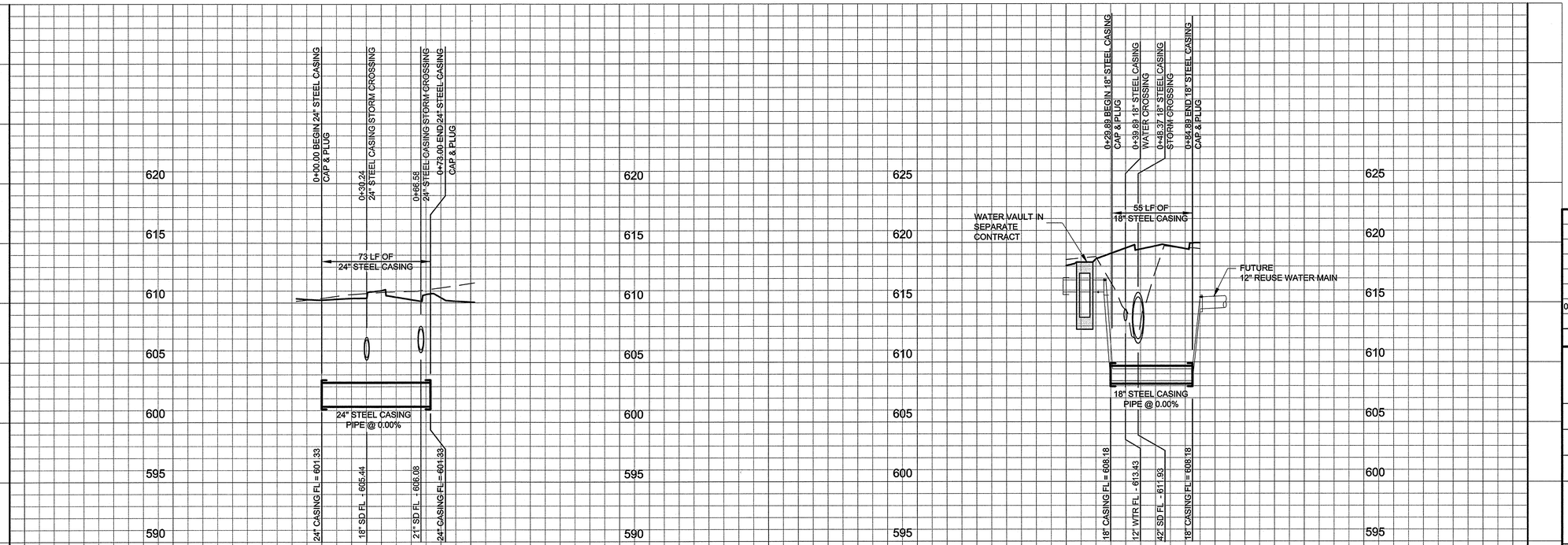
NOTES:

1) EMBEDMENT SHALL BE CLASS B+ OR CEMENT STABILIZED SAND EMBEDMENT.
2) CONTRACTOR TO MAINTAIN 2' CLEARANCE FROM ALL OTHER UTILITIES.

0 20 40 60 80
SCALE IN FEET

LEGEND

- ROW
- STORM MANHOLE
- AREA INLET/JUNCTION BOX
- CURB INLET



ROBERT M. STENGELE
50145
REGISTERED
PROFESSIONAL ENGINEER
STATE OF TEXAS
6-21-12

Huitt-Zollars, Inc.
Firm Registration No. F-761

REV. No.	DESCRIPTION	DATE
1	SHEET ADDED	06/21/2012

REVISIONS AND ISSUE DATES

SHERIDAN
CITY OF FRISCO, TEXAS
CASING INSTALLATION FOR 12" & 14" WATER REUSE LINE STREET CROSSINGS

PCR LAND COMPANY, LLC
8401 NORTH CENTRAL EXPRESSWAY
DALLAS, TEXAS 75202
TEL. 214-292-3410 FAX. 214-292-3411

HUITT-ZOLLARS
Huitt-Zollars, Inc. Dallas
1717 McKinney Avenue, Suite 1400
Dallas, Texas 75202-1236
Phone (214) 871-3311 Fax (214) 871-0757

SCALE H: 1" = 40' V: 1" = 5'
DATE 06/21/2012
SHEET 08-03A

PROJECT NUMBER: 01-3994-17

DWG: I:\proj\Master_PCR\05_Design\CADD\SHERIDAN\dwg\SHEETS\08-03A WATER REUSE SLEEVES.dwg USER: tam
DATE: Jun 25, 2012 2:56pm XREFS: BASE-UTIL BASE-GRADE BASE BASE-DRAIN MASTER PLAN GBS-14in BASE

CAD FILE PATH: I:\proj\master_pcr\05_design\cadd\sheridan\dwg\sheets\08-03a water reuse sleeves.dwg
CITY PROJECT NUMBER: CS11-0019

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